Autism: Biomedical Treatment

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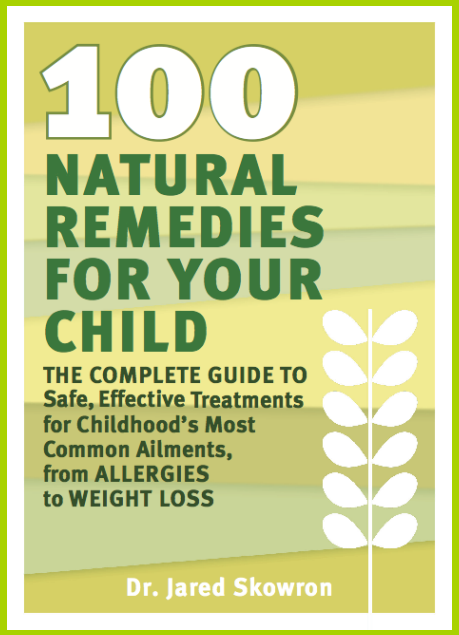
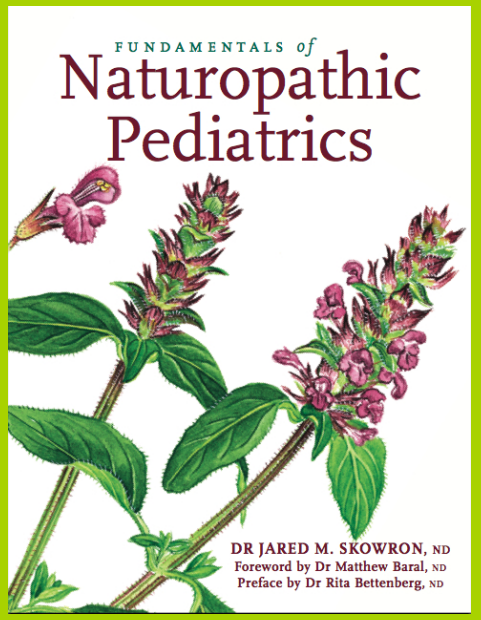
Amazon Best-Selling Author

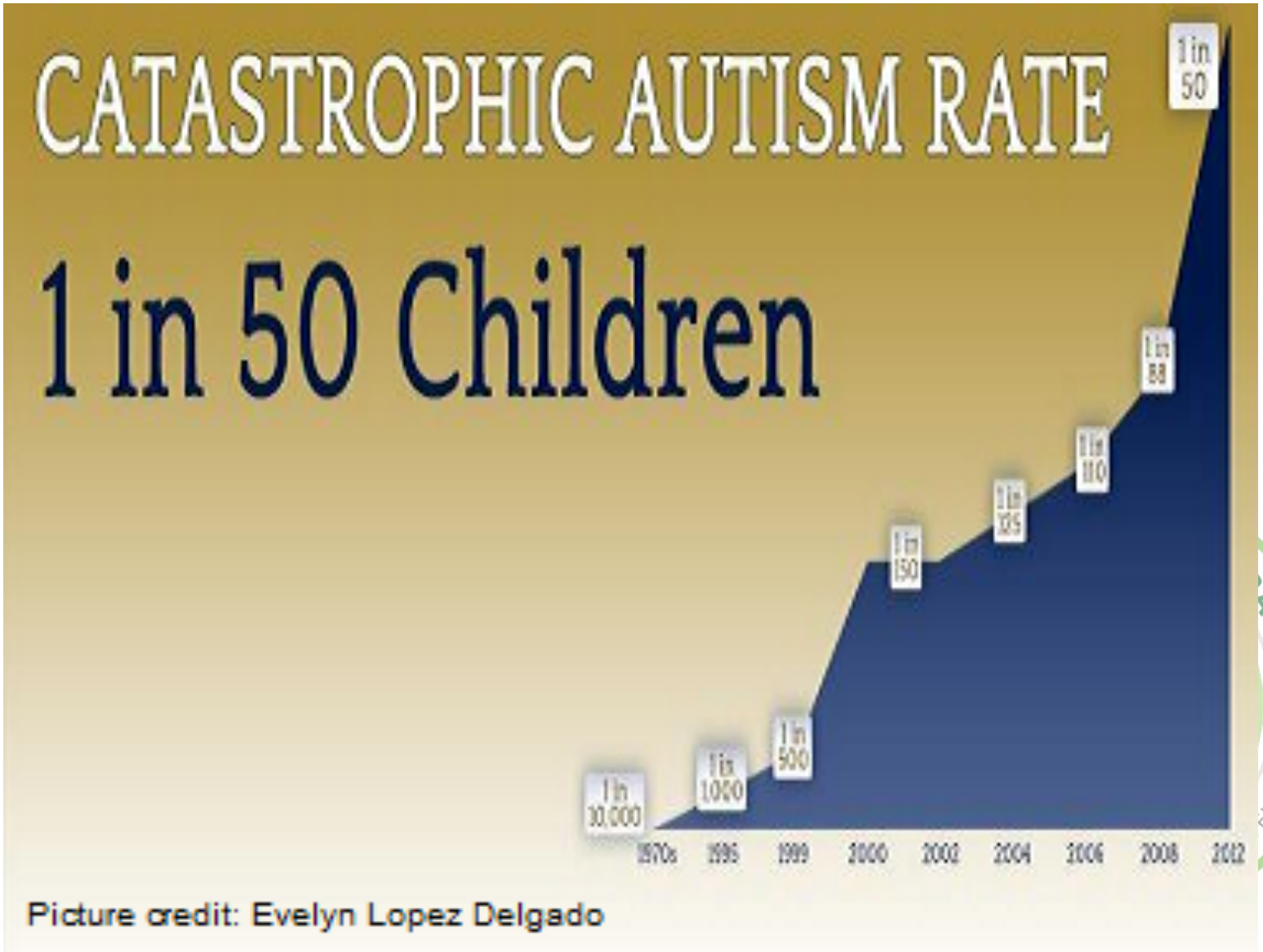


HARVEST PARK NATUROPATHIC
HPN
PEDIATRIC MEDICINE & INTEGRATIVE WELLNESS



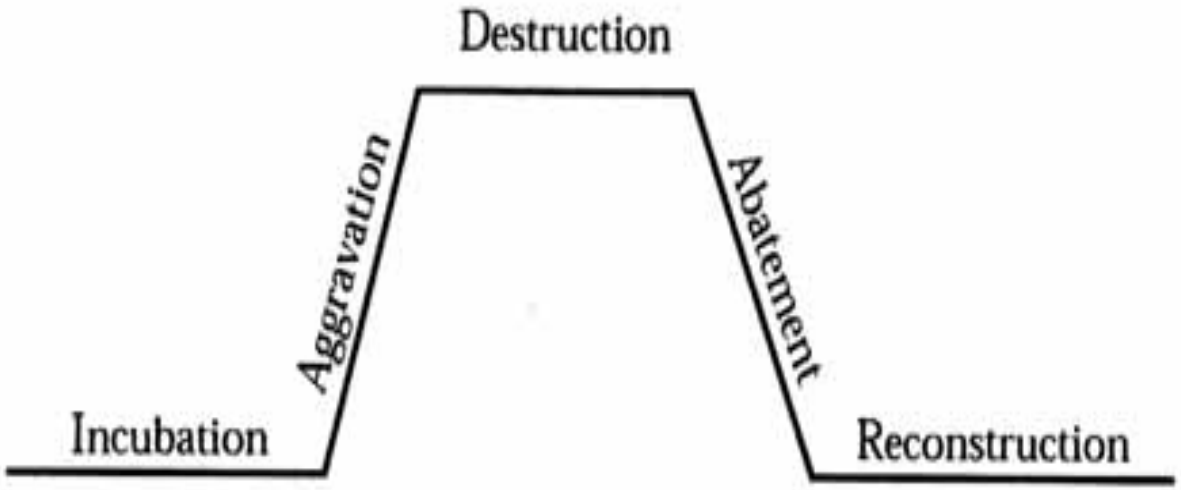
AUTISM HOPE
AHA
ALLIANCE

pedANP
PEDIATRIC ASSOCIATION OF NATUROPATHIC PHYSICIANS



Order of Disease

- Symptom Presentation
- Physiological creation of symptoms
- Homeostatis (inflammation)
- Etiological stressor




The Branches
RHEUMATISM
CANCER
CATARRH
DIPHTHERIA
MEASLES
CONSUMPTION
SPINAL LESIONS
SMALLPOX
APPENDICITIS
COLDS
FEVERS INFLAMMATION
HERIDITY
GERMS, BACTERIA
The Trunk
Lowered Vitality
Abnormal Composition of Blood and Lymph.
Accumulation of Morbid Matter and Poisons in The System.
The Roots
IGNORANCE
INDIFFERENCE
LACK OF SELF CONTROL
SELF INDULGENCE
The Soil
Violation of Natures Laws

Body Systems Affected

- Immune system
  - Inflammation
  - Antibody production
- Nervous system
  - Inability to learn
  - Sensory problems
  - Insomnia
- GI system
  - Bowel abnormalities
- Endocrine system
  - Imbalance of adrenal and thyroid

Immune system

- Increased inflammatory cytokines
- Brain specific auto-antibodies
- Altered immune cell function

- Associated with deficits in language and communication

- Onore C, Careaga M, Ashwood P. The role of immune dysfunction in the pathophysiology of autism. Brain Behav Immun. 2011 Aug 28.

Nervous system

- Dysregulation of GABA
  - Decreased GABA forming enzymes
  - Decreased Purkinje cells
  - GABA protein expression reduced
  - Benzodiazepene binding sites decreased in hippocampus
- Causes anxiety, hyperactivity, insomnia, decreased learning

- Blatt GJ, Fatemi SH. Alterations in GABAergic biomarkers in the autism brain: research findings and clinical implications. Anat Rec (Hoboken). 2011 Oct;294(10):1646-52. doi: 10.1002/ar.21252.

GI system

- Constant dysbiosis
  - Clostridium bacteria
  - Candida
  - Parasites
  - Staph
- Altered bowels, bloating, pain, tantrums, unsociability

- Ekiel A, Aptekorz M, Kazek B, et al. Intestinal microflora of autistic children. Med Dosw Mikrobiol. 2010;62(3):237-43.

Endocrine system

- Higher cortisol response with autism
- Prolonged recovery and duration of cortisol output
- High reactivity of HPA axis
- Stress, fear, anxiety, inflammation

- Spratt EG, Nicholas JS, Brady KT, et al. Enhanced Cortisol Response to Stress in Children in Autism. J Autism Dev Disord. 2011 Mar 22.

Order of treatment

- Where do you start your treatment?
- Which domino will you fix?
- Will that domino be knocked down again?
  - Ie, constant candida Tx
- This leads us to the most important question….

GI symptoms

- Altered bowels
- Bloating
- Eating stool (have to ask)
- Flatulence (Southern wind)
- Pain, agitation, tantrums, desire to be asocial

Gastrointestinal Testing

- Inflammatory changes leads to:
  - Immune suppression leads to
    - Low IgA
    - Pathogen growth
    - Candida, Parasite, Bacteria
  - Lack of digestive support
    - Low enzymes, etc
  - Leaky gut
    - Large gluten, casein, other molecules
  - Inflammatory attack on foods

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BACTERIOLOGY CULTURE

Expected/Beneficial flora	Commensal (Imbalanced) flora	Dysbiotic flora
NG Bacteroides fragilis group	1+ Gamma hemolytic strep	4+ Klebsiella pneumoniae ssp pneumoniae
4+ Bifidobacterium spp.	4+ Hemolytic Escherichia coli	
4+ Escherichia coli	4+ Serratia marcescens	
4+ Lactobacillus spp.		
NG Enterococcus spp.		
1+ Clostridium spp.		

NG = No Growth

BACTERIA INFORMATION

Expected /Beneficial bacteria make up a significant portion of the total microflora in a healthy & balanced GI tract. These beneficial bacteria have many health-protecting effects in the GI tract including manufacturing vitamins, fermenting fibers, digesting proteins and carbohydrates, and propagating anti-tumor and anti-inflammatory factors.

Clostridia are prevalent flora in a healthy intestine. Clostridium spp. should be considered in the context of balance with other expected/beneficial flora. Absence of clostridia or over abundance relative to other expected/beneficial flora indicates bacterial imbalance. If C. difficile associated disease is suspected, a Comprehensive Clostridium culture or toxigenic C. difficile DNA test is recommended.

Commensal (Imbalanced) bacteria are usually neither pathogenic nor beneficial to the host GI tract. Imbalances can occur when there are insufficient levels of beneficial bacteria and increased levels of commensal bacteria. Certain commensal bacteria are reported as dysbiotic at higher levels.

Dysbiotic bacteria consist of known pathogenic bacteria and those that have the potential to cause disease in the GI tract. They can be present due to a number of factors including: consumption of contaminated water or food, exposure to chemicals that are toxic to beneficial bacteria; the use of antibiotics, oral contraceptives or other medications; poor fiber intake and high stress levels.

YEAST CULTURE

Normal flora	Dysbiotic flora
1+ Rhodotorula glutinis/mucilaginosa	2+ Candida lusitaniae
	2+ Candida parapsilosis

INFLAMMATION

	Within	Outside	Reference Range
Lysozyme*	146		<= 600 ng/mL
Lactoferrin	< 0.5		< 7.3 µg/mL
White Blood Cells	None		None - Rare
Mucus	Neg		Neg

IMMUNOLOGY

	Within	Outside	Reference Range
Secretory IgA*		12.1	51 - 204mg/dL

GI Treatment

- Elimination Diet
- Digestive support
  - Probiotics, Digestive Enzymes
- Anti-microbials
  - Silver, Olive leaf, Grapefruit seed
- GI healing
  - Glutamine, DGL, Butyrate

Diets

- GF/CF
- GAPS
  - Specific carbohydrate diet minus dairy
- IgG Elimination
- Phenol elimination

Diet Compliance

- Carb cowboys
  - Kids who just want sweets and carbohydrates
  - Parents who don't want to enforce
- Difficulty with sensory issues
  - Lips have high nerve innervation
  - Kids only want certain tastes
- Will change with GI tx and B vits by changing sensation

Expectations

- Varied with diets
- From miraculous to mild
- Timing of change
  - Dairy quick 1-2 weeks
  - Gluten longer 4-8 weeks
- Enzyme treatment specific to gluten and casein

Digestive support

- Digestive enzymes
  - With each meal

- Williams BL, Hornig M, Buie T, et al. Impaired carbohydrate digestion and transport and mucosal dysbiosis in the intestines of children with autism and gastrointestinal disturbances. PLoS One. 2011;6(9):e24585.

- Most kids can't swallow caps
  - What ingredients are inside?
  - Avoid Betaine HCL

Blood
B
Normal Intestine
Monosaccharide
Disaccharide
Polysaccharide
Small Intestine
Enterocytes
Blood
Lumen
Bacteria
SCFAs
Large Intestine
Colonocytes
C
AUT-GI Intestine
Monosaccharide
Disaccharide
Polysaccharide
Small Intestine
Enterocytes
Inflammation
?
Blood
H2, CO2, CH4
Lumen
Bacteria
SCFAs
?
pH?
H2, CO2, CH4
Bloating, Flatulence
Large Intestine
Colonocytes
H2O; Diarrhea

Digestive support

- Probiotics
  - Base on stool results
  - Dose dependent
- GI symptoms correlated with Sx of autism on ATEC
  - Autism Treatment Evaluation Checklist
  - Dysbiosis in most children

- Adams JB, Johansen LJ, Powell LD, et al. Gastrointestinal flora and gastrointestinal status in children with autism--comparisons to typical children and correlation with autism severity. BMC Gastroenterol. 2011 Mar 16;11:22.

Anti-microbials

- Candida common
  - Nystatin does not absorb across GI
  - Diflucan can cause regression
- Botanicals effective
  - Stool test sensitivity
  - Olive leaf well tolerated
  - Grapefruit seed extract sour, but low dose

GI healers

- Many formulas for GI healing
- Glutamine can covert to glutamate
  - Can cause hyperactivity in a small percentage of children

- Lower glutamine levels in autism

- Shimmura C, Suda S, Tsuchiya KJ, et al. Alteration of plasma glutamate and glutamine levels in children with high-functioning autism. PLoS One. 2011;6(10):e25340.

Figure. 1a

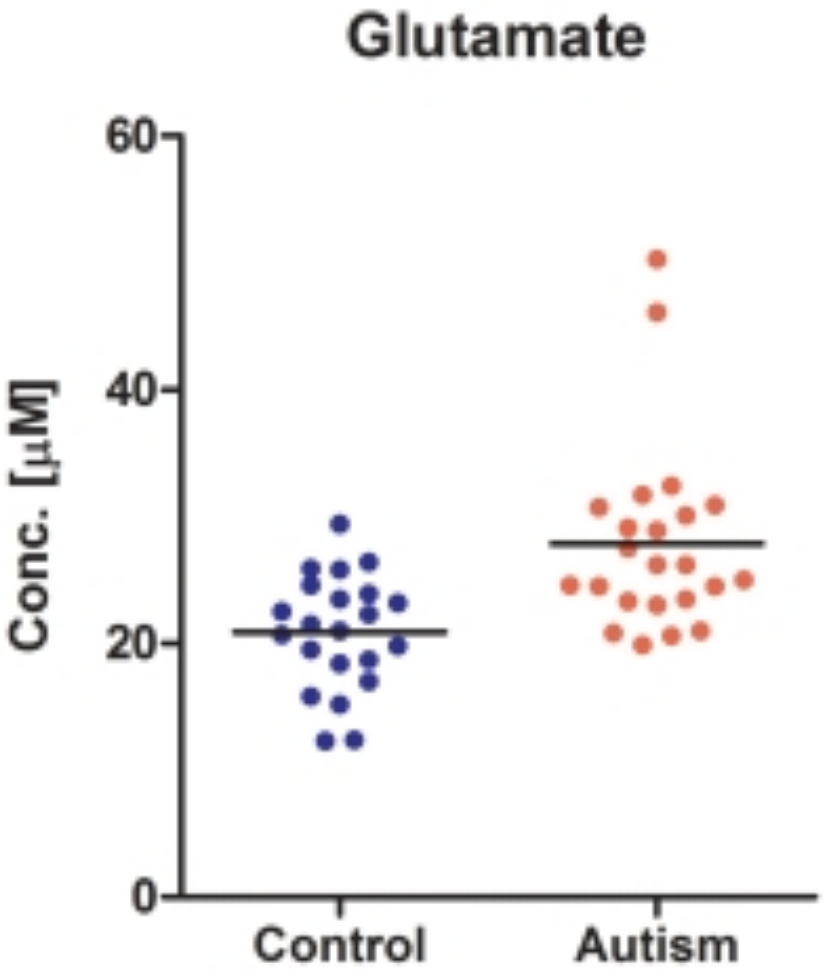
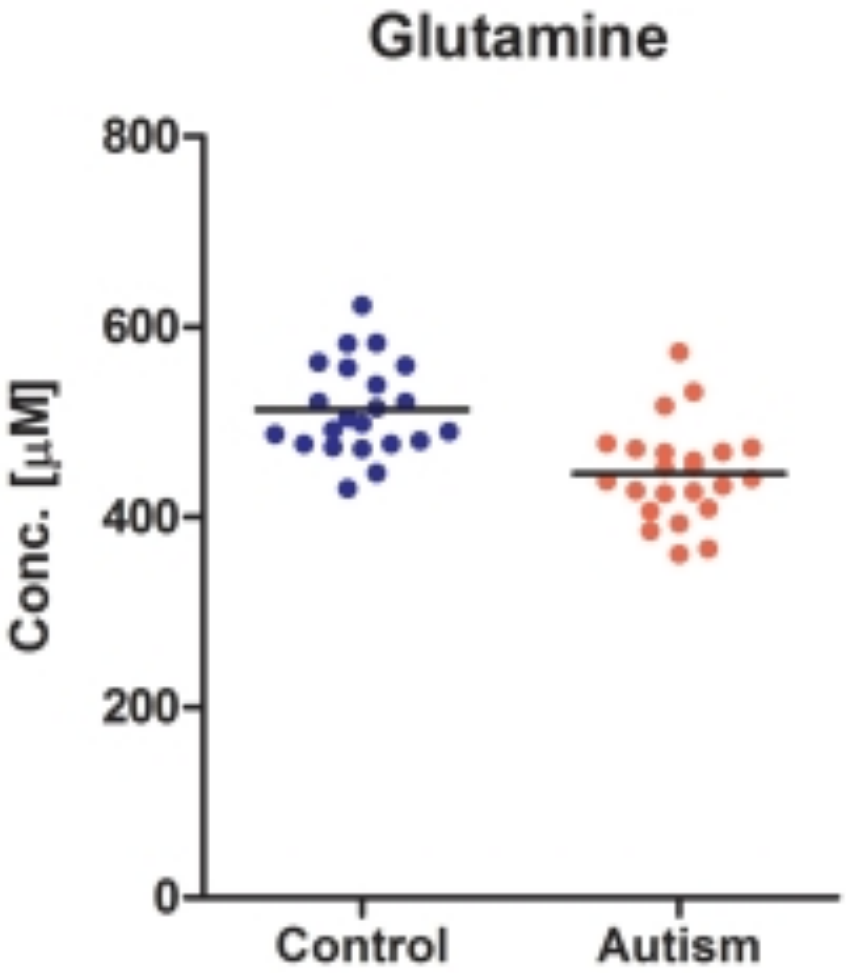


Figure. 1b



GI Review

- Stool testing helps identify pathogens, digestion, inflammation
- Food testing, ie IgG or other can help gear towards diet
  - Parents can experiment as well
- Tx with probiotics, enzymes, anti-microbials, GI healers
- Retest q 3-6mo

GI Goals

- Treating the GI will decrease inflammation
  - Helping to treat the lead cause
- Improvements in mood, learning, speech, temper, and bowels should be expected
- Problems often return when treatment stops, unless the immune system is regulated
- A healed GI allows for better absorption of following treatments

Nervous System Sx

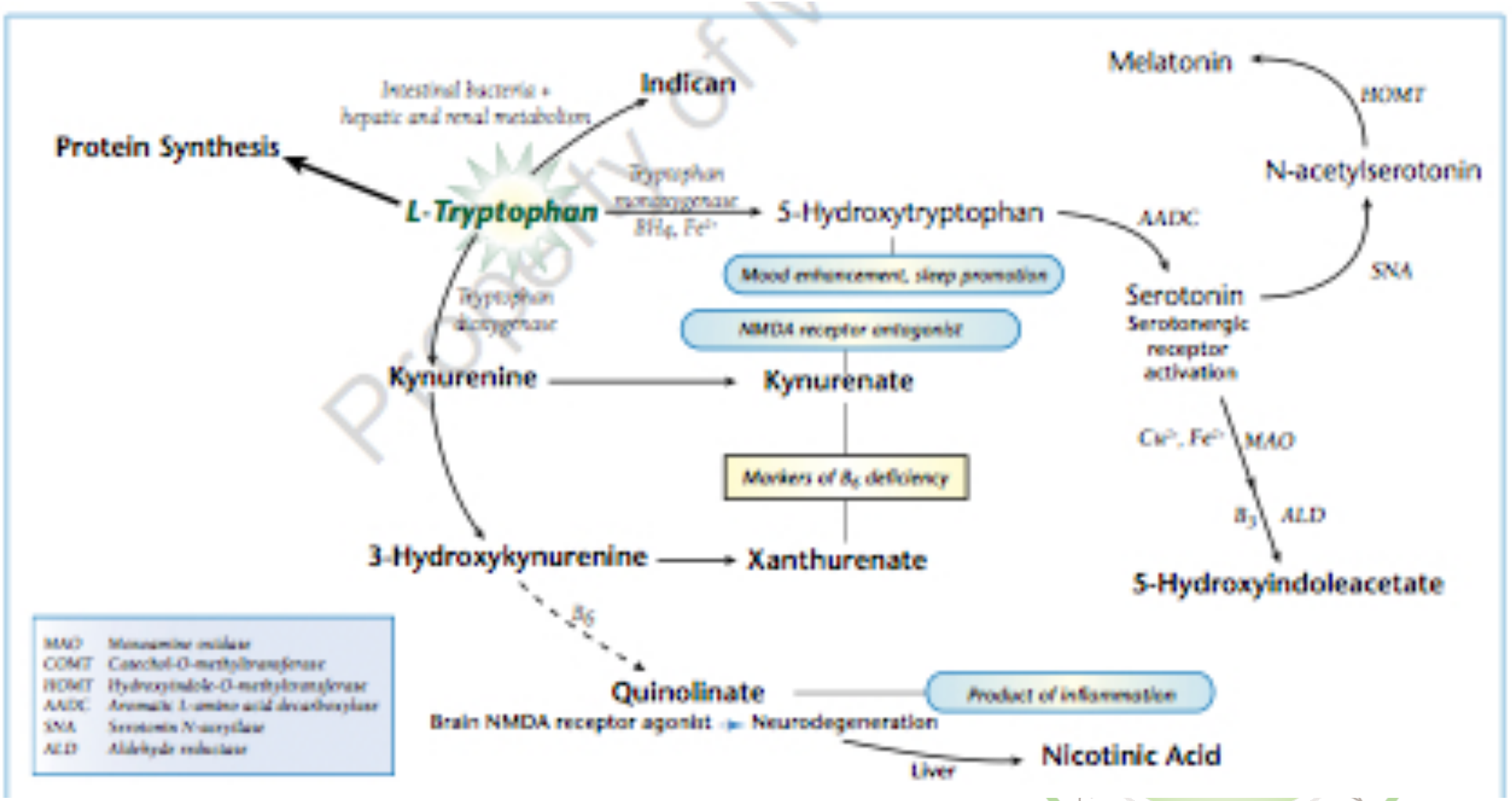
- Delayed development
  - Speech
  - Appropriate social behaviors
  - Motor skills
- Sensory delays
  - Hypersensitive to senses
  - Tags in shirt
- Insomnia

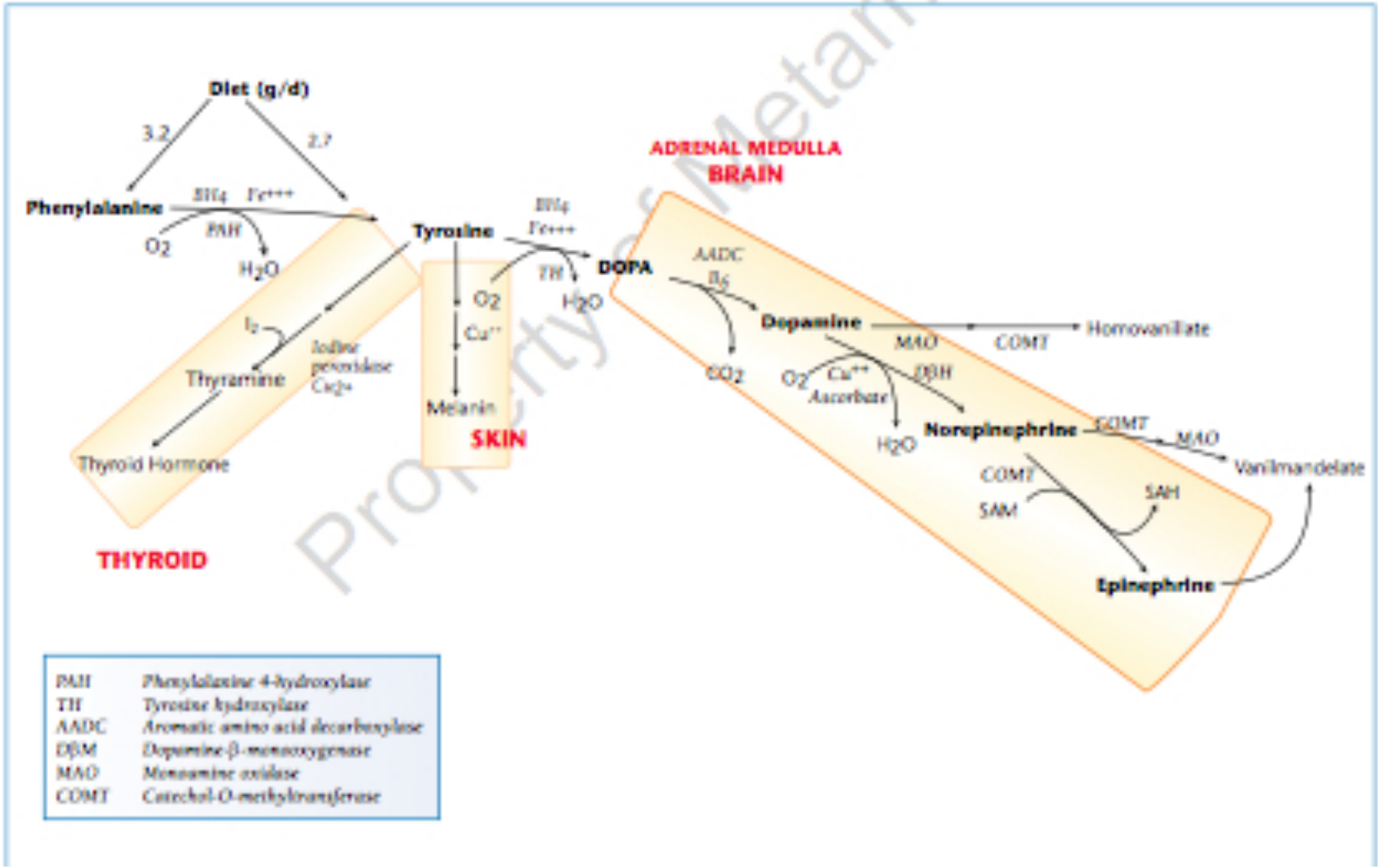
Neuro Testing

- Knowledge of the brain is not complete
- Brain composition can change
- However, there are significantly fewer neurons in the autistic amygdala overall and in its lateral nucleus.
- Postnatal development that includes early enlargement and ultimately a reduced number of neurons
- J Neurosci. 2006 Jul 19;26(29):7674-9
- ASD callosums were disproportionately small adjusted for increased ASD cerebral volume
- J Autism Dev Disord. 2006 Apr 20

Neuro Testing

- Neurotransmitter levels change
- Test in blood or urine
  - Amino acids
  - Neurotransmitters
  - Neuro metabolites
  - Organic acids or vitamin levels
- Tryptophan - Serotonin - 5-HIAA
- Phenylalanine - Tyrosine - Dopamine, Norepinephrine - Epinephrine - VMA - HVA





Neuro Treatment

- B vits essential for neurotransmitter development
- Methyl B12 injections very common
- Work well for some, not at all for others
- Serum B12 levels may be normal
- Check organic acid methylmalonate

Neuro B vitamins

- Folic acid necessary
- 5-MTHF may be low
  - Lack of methyl groups
  - Lack of methyl enzyme
- MTHFR testing
- RBC folate
- Formiminoglutamate organic acid
- Folate trap

Neuro B vitamins

- Vit B6 - P5P
- Improves speech and interactions
- Organic acid kynurenate, xanthurenate
- Other B vitamin deficiencies can be noted on organic acid testing

- Mousain-Bosc M, Roche M, Polge A, et al. Improvement of neurobehavioral disorders in children supplemented with magnesium-vitamin B6. II. Pervasive developmental disorder-autism. Magnes Res. 2006 Mar;19(1):53-62.

5 HIAA	MG/G CREAT	15.9 (H)
CREATININE, RANDOM URINE	MG/DL	15.1

EPINEPHRINE		see note
NOREPINEPHRINE	MCG/G CR	28
CALCULATED TOTAL (E+NE)	MCG/G CR	28 (L)
DOPAMINE	MCG/G CR	212 (L)
CREATININE, RANDOM URINE	MG/DL	15.1

EPINEPHRINE	MCG/G CR	17	6	8
NOREPINEPHRINE	MCG/G CR	30	24	19 (L)
CALCULATED TOTAL (E+NE)	MCG/G CR	47	30	27 (L)
DOPAMINE	MCG/G CR	334	252 (L)	257 (L)
CREATININE, RANDOM URINE	MG/DL	49.6	132.3	32.0

5 HIAA	MG/G CREAT	12.3 (H)	21.8 (H)	134.6 (H)
CREATININE, RANDOM URINE	MG/DL	49.6	132.3	31.8

Amino Acid Testing

- Highlight aminos that are neurotransmitter precursors
  - Tryptophan
  - Phenylalanine
  - Tyrosine
  - GABA

TYROSINE	MMOL/MOL CREAT	10	13
VALINE	MMOL/MOL CREAT	3	4
METHIONINE	MMOL/MOL CREAT	1	1
CYSTATHIONINE	MMOL/MOL CREAT	27 (H)	SEE NOTE
ISOLEUCINE	MMOL/MOL CREAT	1	2
LEUCINE	MMOL/MOL CREAT	3	4
HOMOCYSTINE	MMOL/MOL CREAT	<1	0
PHENYLALANINE	MMOL/MOL CREAT	6	7
TRYPTOPHAN	MMOL/MOL CREAT	8	8

GAMMA AMINO BUTYRIC ACID	MMOL/MOL CREAT	0
3-METHYLHISTIDINE	MMOL/MOL CREAT	15
BETA AMINO ISOBUTYRIC ACID	MMOL/MOL CREAT	21
PROLINE	MMOL/MOL CREAT	1
ETHANOLAMINE	MMOL/MOL CREAT	127 (H)
ALPHA AMINO BUTYRIC ACID	MMOL/MOL CREAT	1
TYROSINE	MMOL/MOL CREAT	19
VALINE	MMOL/MOL CREAT	5
METHIONINE	MMOL/MOL CREAT	1

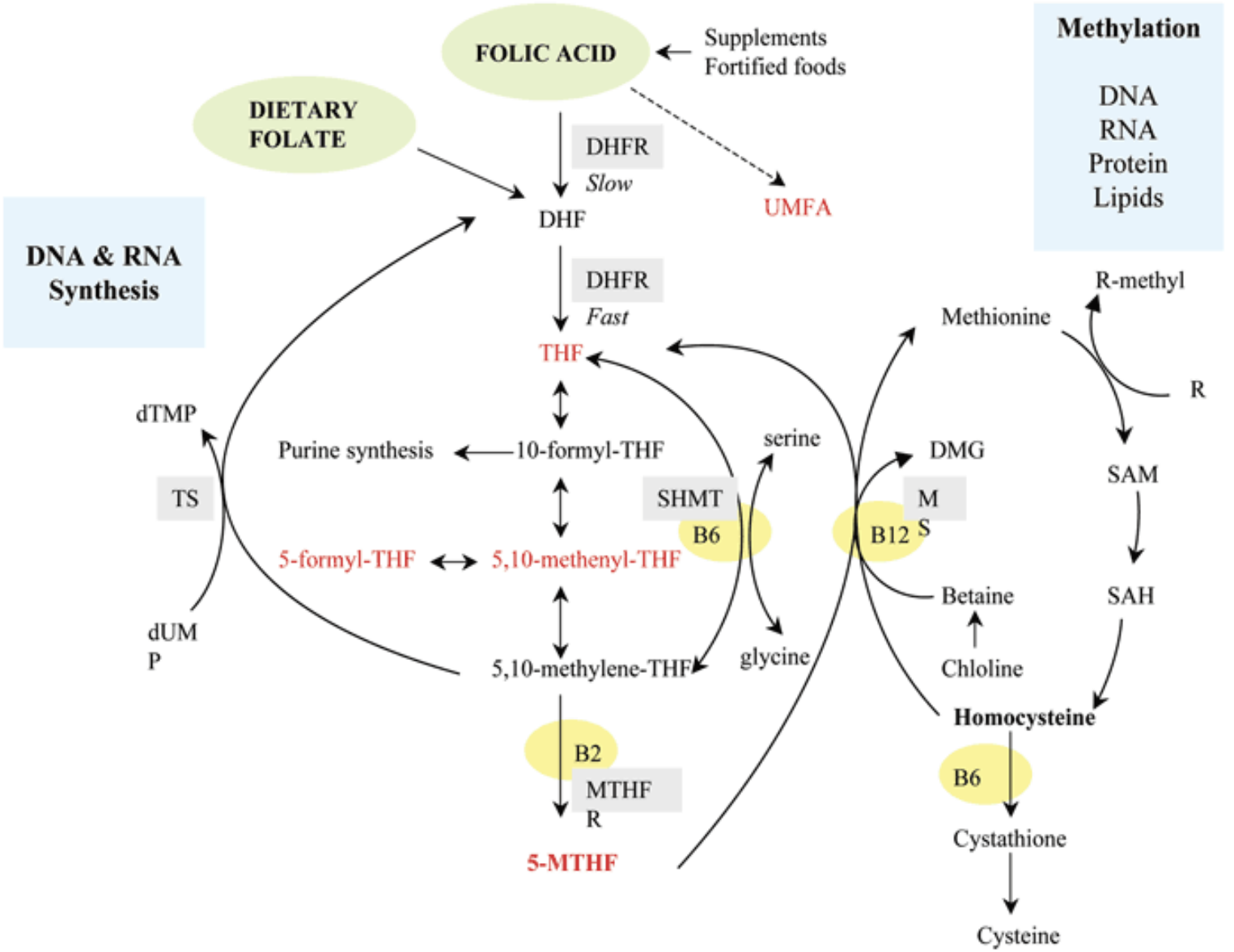
Neuro Treatment

- Nutritional support for neurotransmitter synthesis
- 5-HTP 50-100mg, 1-2x/day
  - Will fatigue
  - Good for insomnia
  - Possibly not good before school
- Tryptophan can be used instead
  - Approx 2-5 grams per dose
- B vitamins, Cu, Fe, 5-MTHF

Autism and 5-MTHF

- Deficiency of folate or cobalamin causes demyelination
- Perhaps due to lack of methyl groups
- Lower levels of SAM (s-adenosyl-methionine) in CSF
- Restoring SAM restores myelin

- Surtees R, Leonard J, Austin S. **Association of demyelination with deficiency of cerebrospinal-fluid S-adenosylmethionine in inborn errors of methyl-transfer pathway.** Lancet. 1991 Dec 21-28;338(8782-8783):1550-4.



Autism and 5-MTHF

- CSF levels of P5P
  - Activated, phosphorylated B6
- Positive correlation with 5-MTHF and BH4 levels

- Footitt EJ, Heales SJ, Mills PB, et al. **Pyridoxal 5'-phosphate in cerebrospinal fluid; factors affecting concentration.** J Inherit Metab Dis. 2011 Apr;34(2):529-38.

Neuro Treatment

- GABA - your new favorite friend
  - 750 - 1,500mg, 1-2 x/day
  - Reduces anxiety, hyperactivity, tantrums
  - Non-Drowsy
  - Can help insomnia

Neuro Treatment

- B vitamins
  - Difficult compliance orally due to taste of B1, B2, B3, B5
    - Folate, B6, B12 taste ok
  - Methyl B12 shots available
  - B vit patches available
    - Irritating to those with sensory issues
  - Low dose B complex with high MB12, 5-MTHF, P5P added
  - 5-MTHF is a MUST for those with MTHFR mutations

Neuro Treatment

- Phenylalanine, Tyrosine
  - Not recommended
  - Even if catecholamines are low
  - Elevating them with Phe or Tyr:
    - Worsening of tantrums
    - Worsening of moods
    - Worsening of hyperactivity
    - Worsening of aggression
- Risperidol only approved autism drug to reduce aggression and violence
  - Dopamine Antagonist

Neuro Tx Expectations

- Changes in mood from amino acid and vitamin treatment should be noticed quickly.
  - Within one week
  - Effect of aminos wears off in 6-8 hours
  - Repeat dosing necessary PRN
- Mood, tantrums, hyperactivity change quickly
- Learning through ST/OT/ABA/Son-Rise, etc, will now be faster
- "Clicking the Play button"

Neuro Tx Expectations

- Stopping these therapies usually causes an immediate worsening of mood and behavior
  - Does not cause a reversal of learning
- Possibly beneficial for parents to reinforce the therapy has merit
- 'Typical Dad Learns'

Neuro Review

- Testing
  - Neurotransmitters in blood or urine
  - Amino acid testing in blood or urine
  - Organic acid testing in blood or urine
  - Other nutrient testing, MTHFR
- Treatment
  - GABA, 5-HTP, B vits, P5P, MB12, 5-MTHF, Mg, Zn/Cu, Fe

Neuro Goals

- Improving healthy neurotransmitter levels allows the brain to function more properly
- Learning that did not happen begins to happen
- It does not happen any faster than a neurotypical child

Neuro Goals

- Get reports from school teachers, therapists, etc
- When the children start neuro treatment, they will be advancing much faster
- Expect improved moods, less tantrums, less hyperactivity
- Decreased sensory issues also
  - Ask about haircuts, nail clippings, etc

Free form amino vs Diet

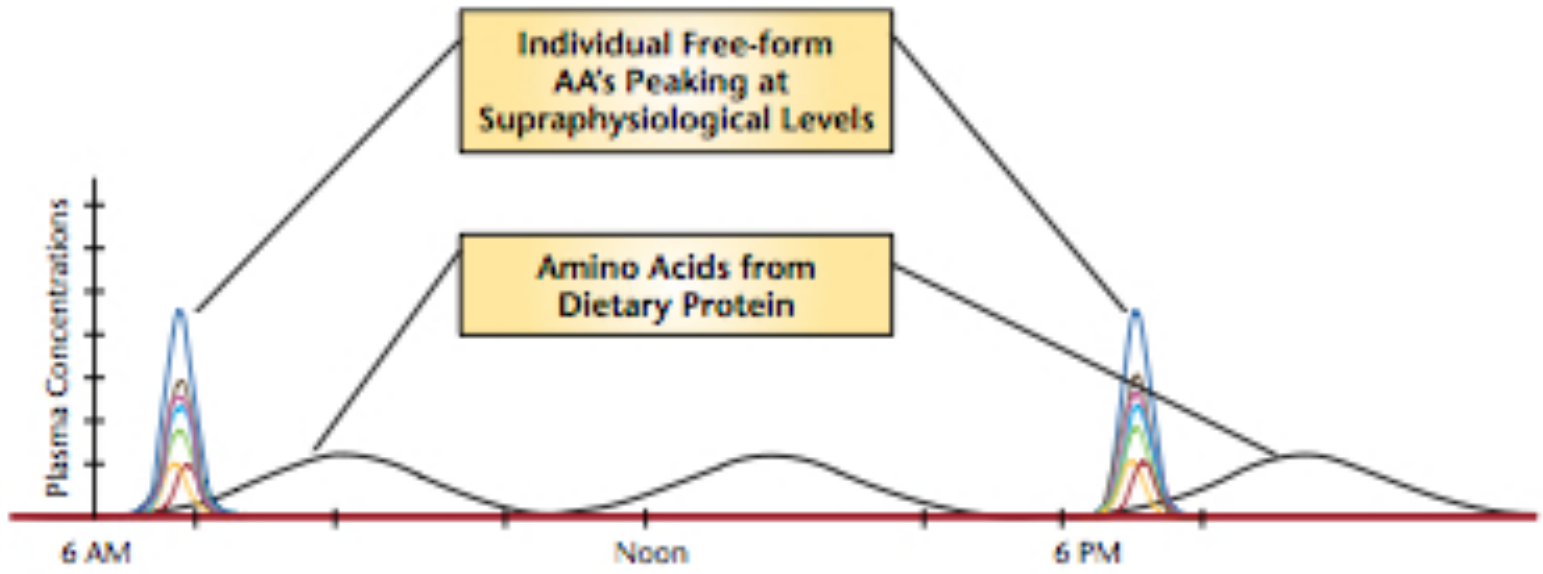


FIGURE 4.32 — Representation of Daily Plasma Amino Acid Levels

Schematic approximations are shown for plasma concentrations of essential amino acids from three meals of dietary protein compared with twice daily oral dosing with 5 grams of a free-form essential amino mixture. Although the supplement supplies only a fraction of total daily intake, the immediate delivery to absorptive mechanisms without need for protein digestion means that assimilation is rapid. Each amino acid (represented by colored lines) is delivered to the tissues at mild supraphysiologic concentration, allowing greater saturation of multiple biosynthetic and energetic processes.

Don't forget…

- Magnesium
  - Researched for autism since 1950's
  - Calming to nervous system
- Zinc
- Low Zn/Cu ratio in children with autism
  - <0.7 (<2.5% healthy children)

- Faber S, Zinn GM, Kern JC 2nd, et al. **The plasma zinc/serum copper ratio as a biomarker in children with autism spectrum disorders.** Biomarkers. 2009 May;14(3):171-80.

- Lithium
- Possibly beneficial with FH of bipolar

- Kerbeshian J, Burd L, Fisher W. **Lithium carbonate in the treatment of two patients with infantile autism and atypical bipolar symptomatology.** J Clin Psychopharmacol. 1987 Dec;7(6):401-5.

Don't forget…

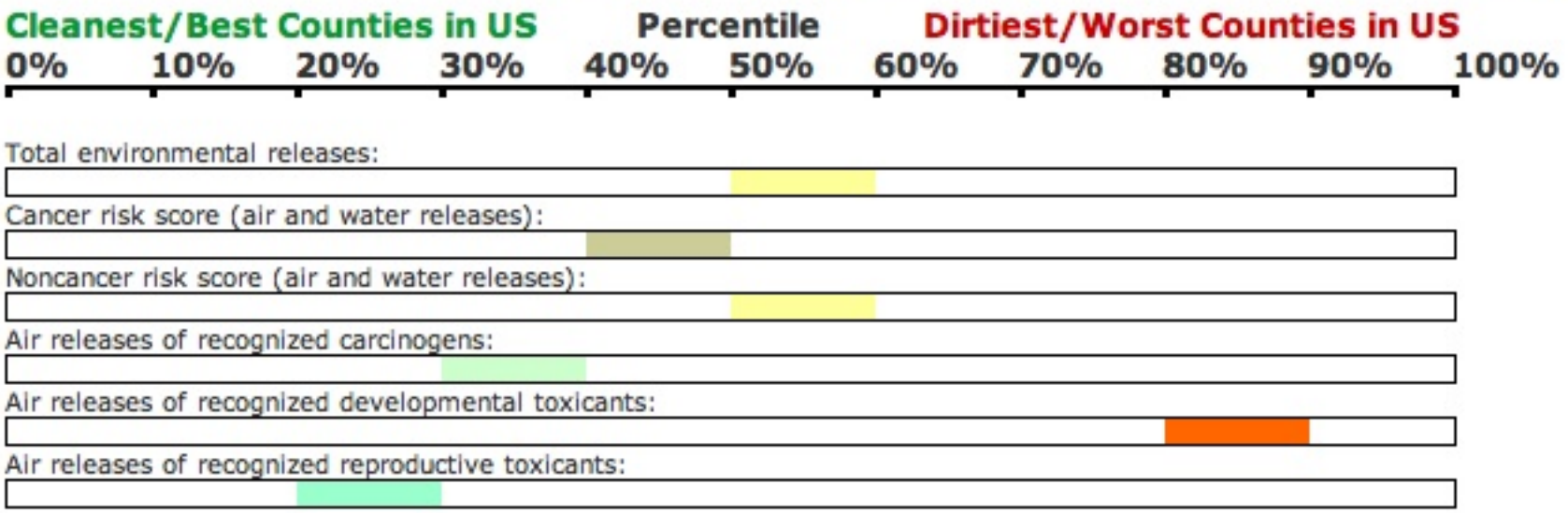
- Fish oil
  - Nutrients for myelin
  - Anti-inflammatory
- Decreases hyperactivity
- Bent S, Bertoglio K, Ashwood P, et al. A pilot randomized controlled trial of omega-3 fatty acids for autism spectrum disorder. J Autism Dev Disord. 2011 May;41(5):545-54.
- Best in those with eczema/dry skin
- Fish oil
  - Electric cord analogy
  - Toxins in fat….

Condition-specific recommendations from the data presented			
Condition	**EPA-Rich**	**EPA/DHA**	**DHA-Rich**
General Health		XX	
Improving w3:w6 ratio		XX	
Low-Risk CVD prevention		XX	X
High CVD Risk/Atherosclerosis		X	XX
Inflammatory Diseases	X	XX	
Depression	XX	X	
Macular Degeneration			XX
Alzheimer- Dementia		X	XX
Maternal- Childhood Development		X	XX

Toxins

- Prenatal environmental factors and
- Parental psychopathology are associated with the risk of autism.
- Am J Epidemiol. 2005 May 15;161(10):916-25; discussion 926-8.
- Children with autism have significantly ($p < 0.001$) higher in-hair concentration levels of lead, mercury and uranium
- Autism. 2005 Aug;9(3):290-8.
- Autistic baby teeth have 2.1 fold as much mercury than controls
- Adams JB, Romdalvik J. J Toxicol Environ Health A, 2007 Jun; 70(12).

- **2002 Rankings: Major Chemical Releases or Waste Generation in HILLSBOROUGH County***



Rank	Facility	City	Pounds
1	NASHUA CORP.	MERRIMACK	67,649
2	KALWALL CORP. PANELS & ACCESSORIES DIV.	MANCHESTER	48,291
3	MONADNOCK PAPER MILLS INC.	BENNINGTON	20,689
4	HITCHINER MFG. CO. INC.	MILFORD	20,142
5	BATESVILLE MFG. INC.	NASHUA	15,297
6	VELCRO USA INC.	MANCHESTER	13,183
7	PARKER HANNIFIN CORP. CHOMERICS DIV.	HUDSON	5,301
8	TERADYNE CIRCUITS	NASHUA	5,165
9	ELECTROPAC CO. INC.	MANCHESTER	4,506
10	UPACO ADHESIVE	NASHUA	3,832
11	PRIMERO INC.	NASHUA	3,750
12	HAMPSHIRE CHEMICAL CORP.	NASHUA	3,308
13	SANMINA-SCI CORP. HADCO CORP. A SUBSIDIARY	HUDSON	1,268
14	FREUDENBERG-NOK GENERAL PTNR.	MANCHESTER	499
15	BRONZE CRAFT CORP.	NASHUA	284
16	MORGAN ADVANCED CERAMICS	HUDSON	255
17	NEW HAMPSHIRE BALL BEARINGS	PETERBOROUGH	241
18	GL&V PULP GROUP INC.	NASHUA	53
19	OSRAM SYLVANIA PRODS. INC.	HILLSBORO	50
20	NYLON CORP. OF AMERICA	MANCHESTER	20

Dirty Dozen

- Celery
- Peaches
- Strawberries
- Spinach
- Cherries
- Kale/Collard
- Apples
- Potatoes
- Blueberries
- Grapes (imported)
- Nectarines
- Bell Peppers

Clean Fifteen

- Onions
- Kiwi
- Pineapple
- Sweet peas
- Grapefruit
- Sweet Potato
- Avocado
- Sweet Corn
- Mangoes
- Watermelon
- Asparagus
- Honeydew Melon
- Cabbage
- Eggplant
- Cantaloupe

Mercury in Fish

- **Highest**
- Tilefish
- Shark
- Swordfish
- King Mackerel
- Tuna
- Orange Roughy

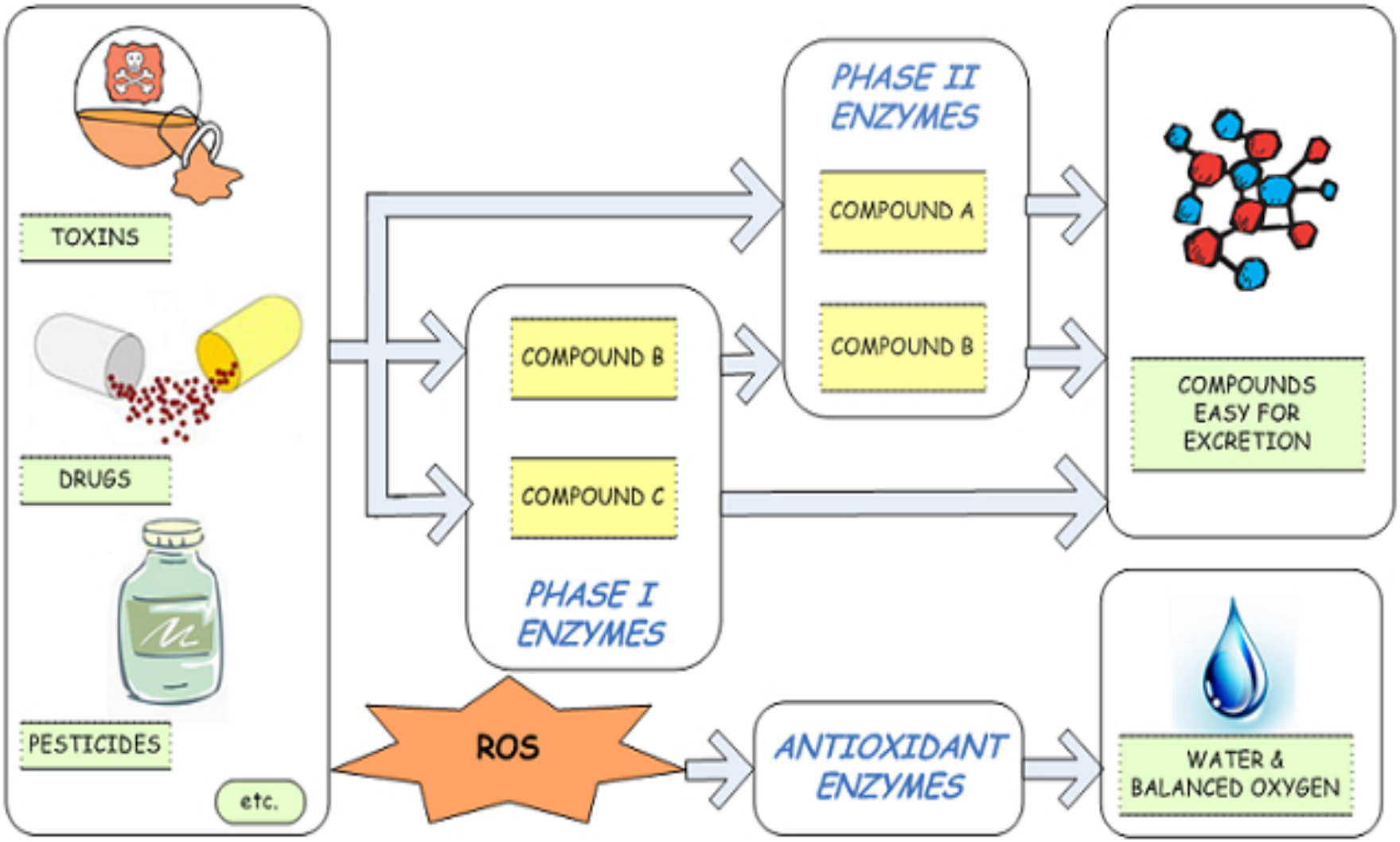
- **Lowest**
- Clam
- Ocean Perch
- Canned Salmon
- Shrimp
- Whiting
- Tilapia

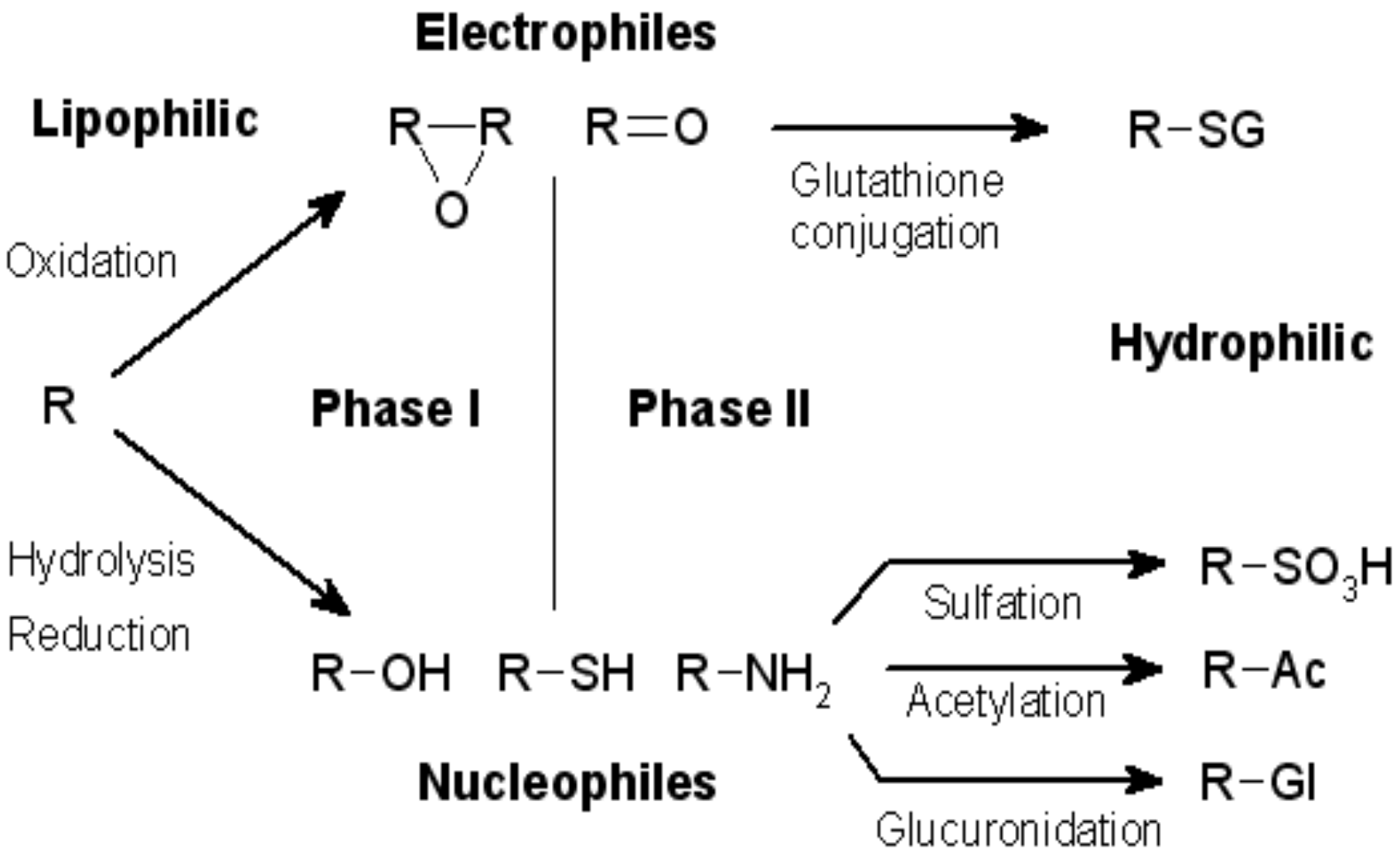
Farmed vs. Fresh

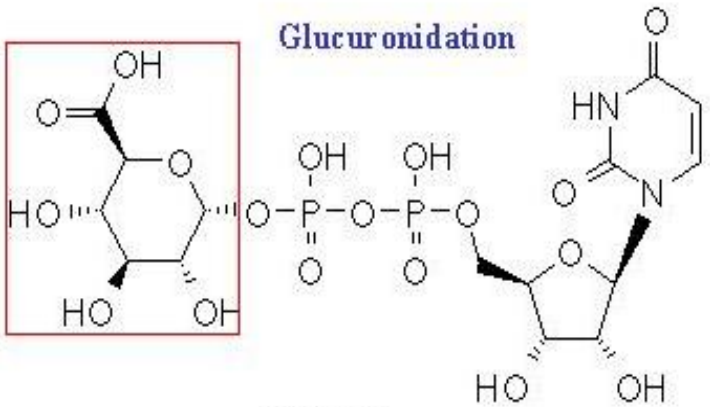
- Farmed salmon has 40 times the PCBs compared with wild caught salmon, beef, pork, poultry and milk.
- Farmed salmon has high levels of PCBs, dioxins, dieldrin, DDT, and Mirex.
- EPA recommends only 1 meal of farmed salmon per month. Anything more will increase risk of cancer.
- Salmon farmed in the North Sea, EPA recommends 1/2 meal per month.

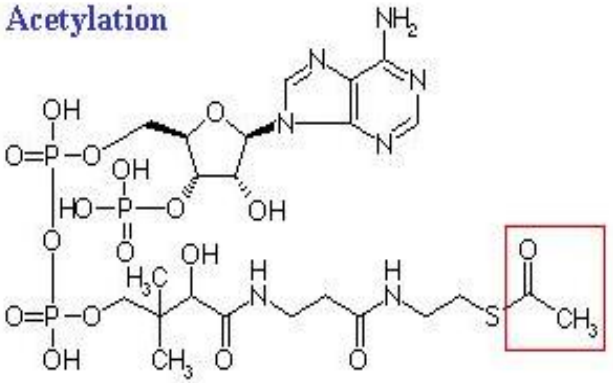
Toxin labs

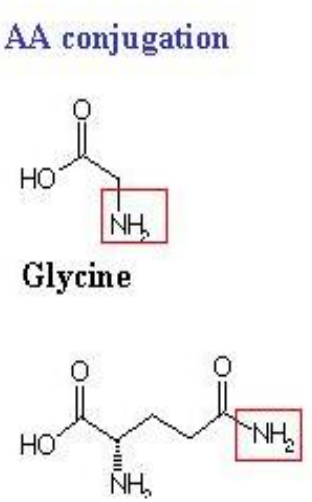
- Heavy Metal testing
  - Urine - acute exposure
  - Stool - acute exposure
  - Hair - 1 month of acute exposure
  - Fat biopsy - gold standard
    - Not practical
  - Challenged urine - optimal
- Porphyrins
- Other toxins

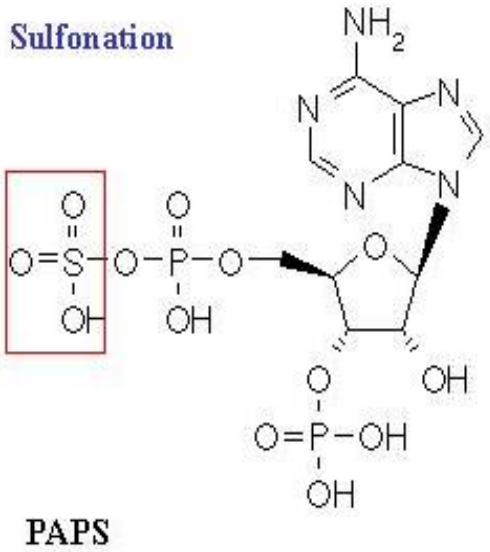


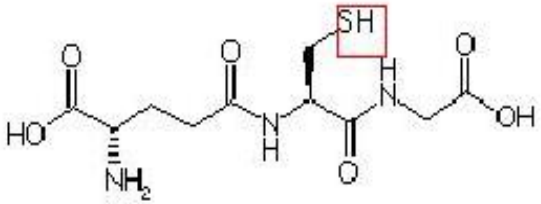


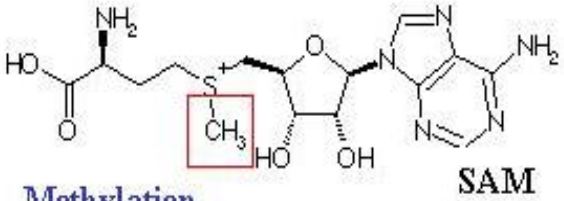












Cofactors for Phase II biotransformation

Functional group that is transferred or reacts with the xenobiotic

Toxin treatments

- Remove extracellular
  - Activate Phase 2 detoxification
  - NAC, Glycine, Glutamine
  - Methyl groups, Antioxidants to protect
  - DMSA, EDTA, DMPS, DFO
- Intracellular - homeopathic
- Other - epsom salt baths, sauna, etc

Toxic Expectations

- Slow improvement
  - Permanent improvement
- Detoxification is curative
- Improvement speech, sociability, behavior

T.C. 4 yo boy

- Dx: Autism
  - Moderate level
  - Very little speech
  - Hyperactive, anxious, fearful, OCD
  - Stimming present
  - Toe-walking
  - Moderate sensory issues to touch, eye-contact, and tastes

Analyte	Result Value	Ref. Ra
EPINEPHRINE	see note	

Epinephrine concentration was below the sensitivity of the assay 2.0 ug/L. Therefore the result was <6.8 mcg/g creat. This result was calculated by dividing 2.0 mcg/L by the creatinine concentration in g/L.

Reference Range: 4-32 mcg/g cr

NOREPINEPHRINE	see note	

Norepinephrine concentration was below the sensitivity of the assay 2.0 ug/L. Therefore the result was <6.8 mcg/g creat. This result was calculated by dividing 2.0 mcg/L by the creatinine concentration in g/L.

Reference Range: 20 - 108 mcg/g cr

CALCULATED TOTAL (E+NE)	see note	

Calculation cannot be performed.

DOPAMINE	see note	

Dopamine concentration was below the sensitivity of the assay 10.0 ug/L. Therefore the result was <34.1 mcg/g creat.This result was calculated by dividing 10.0 mcg/L by the creatinine concentration in g/L.

Reference Range: 295 - 1123 mcg/g creat

This specimen was submitted with a pH greater than 5.0. Optimum pH for this assay is 1.0-5.0. Improper preservation may compromise the validity of the assay.

CREATININE, RANDOM URINE	29.3	2-149

SERINE	272	13-127
ASPARAGINE	163	3-42
ALPHA AMINO ADIPIC ACID	19	< OR = 34
GLYCINE	1408	23-413
GLUTAMINE	281	18-188
SARCOSINE	3	< OR = 2
BETA ALANINE	8	< OR = 5
TAURINE	1031	< OR = 255
HISTIDINE	312	9-425
CITRULLINE	11	< OR = 4
ARGININE	12	< OR = 8
THREONINE	85	4-60
ALANINE	235	8-156

TYROSINE	73	3-48
VALINE	15	2-20
METHIONINE	3	< OR = 5
CYSTATHIONINE	2	< OR = 8
ISOLEUCINE	6	< OR = 5
LEUCINE	14	< OR = 13
HOMOCYSTINE	<1	<1
PHENYLALANINE	43	2-22
TRYPTOPHAN	29	2-27
ORNITHINE	3	< OR = 5
LYSINE	30	3-112
CYSTINE	19	3-20
HYDROXYLYSINE	9	< OR = 8

T.C. p 2mo 5-MTHF

- Tx: 5-MTHF, B complex, Mag, Fe
  - Increased speech
  - Greatly improved
  - Calmer
  - Interacting with siblings and kids at school
  - Beginning toilet training
  - Motor skills improving - gross and fine

Analyte	Result Value		Ref. Range
TEST NAME:	5 HIAA RANDOM URINE		
RESULT:	7.9		12.0 OR LES
Creatinine, Random Urine	17	mg/dL	2-149

EST DIAGNOSTICS-NICHOLS MISCELLANEOUS ORDER 2

Lab: EZ Result Date: 06

Analyte	Result Value		Ref. Range
TEST NAME:	CATECHOLAMINES RANDOM URINE		
RESULT:			
Epinephrine	<18	mcg/g creat	4-32
Result below clinical reportable range for this analyte, which is 3 mcg/L. Reported result was calculated using 3 mcg/L.			
Norepinephrine	40	mcg/g creat	20-108
Calculated Total (E+Ne)	40	mcg/g creat	30-130
Dopamine	405	mcg/g creat	295-1123
Creatinine, Random Urine	17	mg/dL	2-149

SERINE	97	13-127
ASPARAGINE	69	3-42
ALPHA AMINO ADIPIC ACID	10	< OR = 34
GLYCINE	598	23-413
GLUTAMINE	189	18-188
SARCOSINE	1	< OR = 2
BETA ALANINE	10	< OR = 5
TAURINE	13	< OR = 255
HISTIDINE	584	9-425
CITRULLINE	2	< OR = 4
ARGININE	14	< OR = 8
THREONINE	33	4-60

SERINE	272	13-127
ASPARAGINE	163	3-42
ALPHA AMINO ADIPIC ACID	19	< OR = 34
GLYCINE	1408	23-413
GLUTAMINE	281	18-188
SARCOSINE	3	< OR = 2
BETA ALANINE	8	< OR = 5
TAURINE	1031	< OR = 255
HISTIDINE	312	9-425
CITRULLINE	11	< OR = 4
ARGININE	12	< OR = 8
THREONINE	85	4-60
ALANINE	235	8-156

TYROSINE	48	3-48
VALINE	9	2-20
METHIONINE	2	< OR = 5
CYSTATHIONINE	1	< OR = 8
ISOLEUCINE	4	< OR = 5
LEUCINE	6	< OR = 13
HOMOCYSTINE	<1	<1
PHENYLALANINE	28	2-22
TRYPTOPHAN	20	2-27

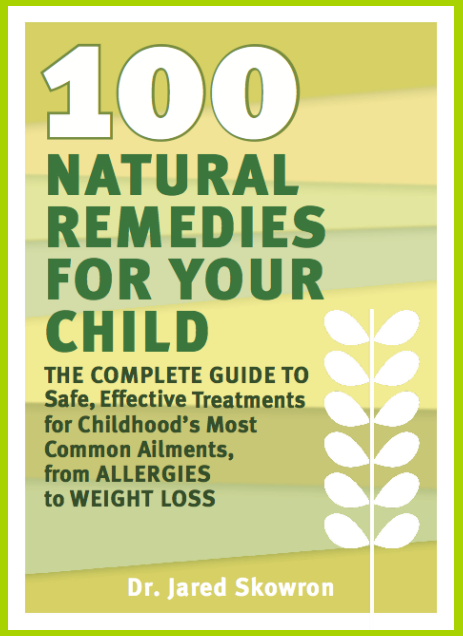
TYROSINE	73	3-48
VALINE	15	2-20
METHIONINE	3	< OR = 5
CYSTATHIONINE	2	< OR = 8
ISOLEUCINE	6	< OR = 5
LEUCINE	14	< OR = 13
HOMOCYSTINE	<1	<1
PHENYLALANINE	43	2-22
TRYPTOPHAN	29	2-27
ORNITHINE	3	< OR = 5
LYSINE	30	3-112
CYSTINE	19	3-20
HYDROXYLYSINE	9	< OR = 8

The future…

- Stopping the auto-immune reaction
- Toxins
  - Increasing detoxification
  - Remove toxic exposures
- How to stop the antibody and inflammatory response?
  - Anti-inflammatories?
  - Homeopathic cytokines?
  - Standard anti-inflammatories, ie prednisone are not effective

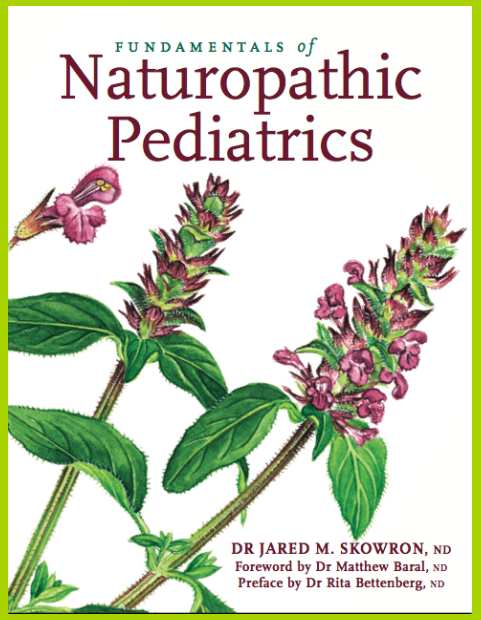
Your role

- ‘There is no false hope, only false pessimism.’
  - Raun Kaufman, Son-Rise
- Support the child
- Remember the parents are under tremendous stress
- The children will recover



HARVEST PARK NATUROPATHIC
HPN
PEDIATRIC MEDICINE & INTEGRATIVE WELLNESS

Spectrum Awakening



Jared M. Skowron, ND

www.SpectrumAwakening.com

www.NaturopathicAnswer.com