AUTISM RESEARCH INSTITUTE
Autism is Treatable

The Quick Start

Tips for Introducing Nutritional Supplements and Special Diets

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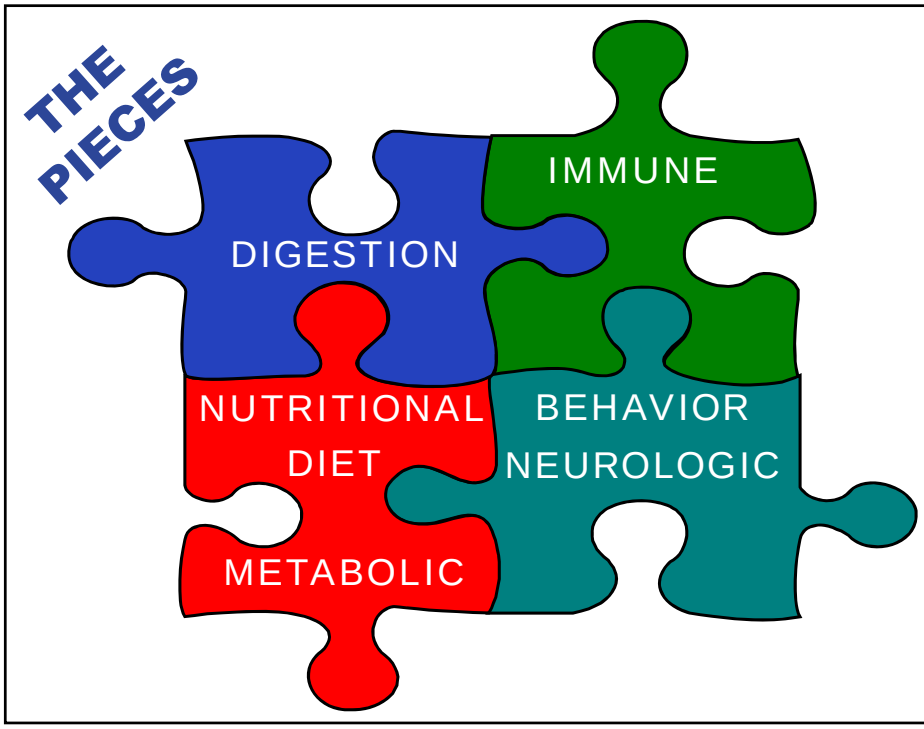
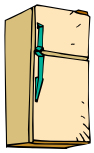
Licensed Dietitian Nutritionist



EVOLUTION OF AUTISM THEORY



"Refrigerator mother"

↓

Educational/psychiatric disorder

↓

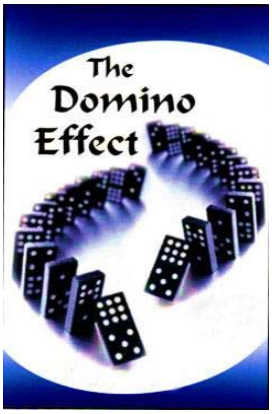
Biomedical disease

Pamela Compart, MD

WHERE WE ARE: AUTISM

THE CONSEQUENCES OF ENVIRONMENTAL IMPACT ON GENE VARIANTS AND GENE EXPRESSION

- **Dysfunctions in the following:**
  - Inflammation and immunity
  - Barrier integrity (leaky membranes)
  - Gastrointestinal function
  - Neurological function
  - Metabolism and biochemistry
    - Methylation, Oxidation, Sulfation, Detox
    - Mitochondrial function, CFD
- **Resulting impaired responses to:**
  - Surroundings and stimuli
  - Foods and food components
  - Toxins, artificial chemicals, pesticides, medications, drugs



"I may look like I'm doing nothing, but on a cellular level, I'm actually quite busy."

Pamela Compart, MD

OUR CHILDREN THEN AND NOW

Increasing Illness and Disabilities

Condition	<1980	Current
Diabetes	7000	125,000
Asthma	2 Million	9 Million
Learning Disabilities	796,000	3 Million
ADD / ADHD	<1 Million	4.4 Million
Autism	1 out of 2000	1 out of 88 1 out of 54 boys

BEYOND GENETICS
THERE ARE NO GENETIC EPIDEMICS!

OUR CHILDREN THEN AND NOW

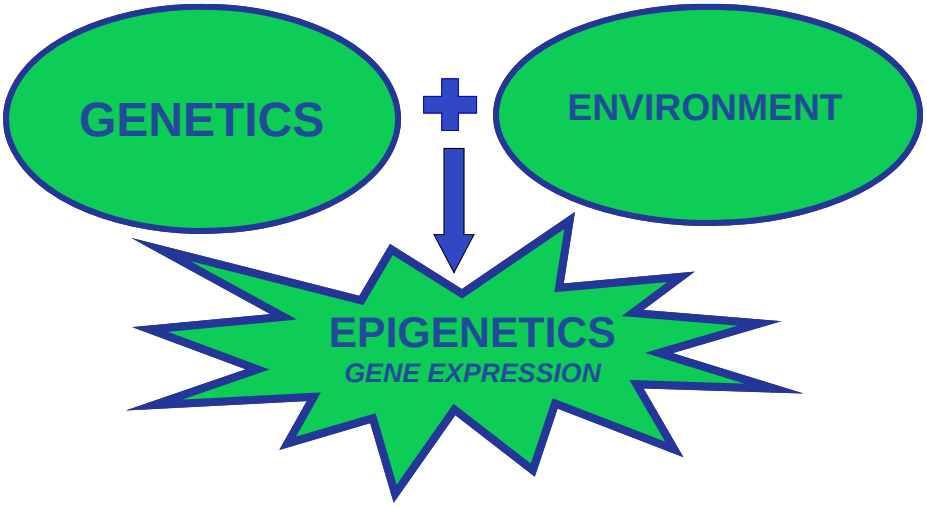
Increasing Illness and Disabilities

Why are ADHD and Autism increasing?

BEYOND GENETICS
THERE ARE NO GENETIC EPIDEMICS!

ENVIRONMENTAL MODIFICATION

OF GENE EXPRESSION



ENVIRONMENTAL RISK FACTORS

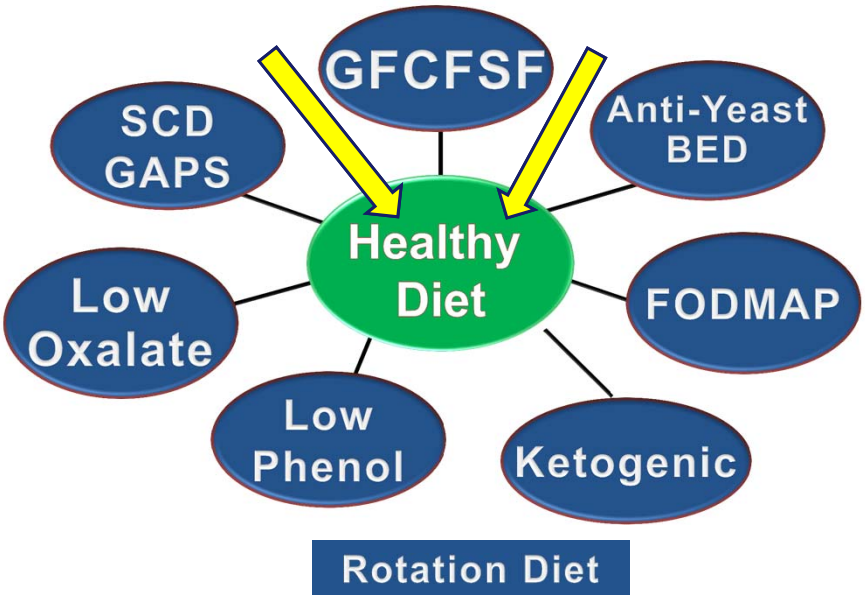
- Environmental toxins and pollutants
- Smoking and “second hand” exposure
- Sedentary lifestyle and stress
- Poor diet and water
- Health problems
- Allergies
- Food intolerances
- Artificial light exposure
- Aging and free radical pathology
- Aluminum cookware and plastics
- Medications and medication reactions

GOALS DIETARY AND NUTRITIONAL INTERVENTIONS

IMPROVEMENTS

- **Appetite**
  Nutrition
  Digestion
  GI Function
- **Cognition**
  Language
  Learning
  Attention
- **Behavior**
  Social
  Sensory
  Processing

CORE HEALTHY DIET + SPECIAL DIETS AS NEEDED



BASIC DIET AVOIDS

- Artificial sweeteners, additives, colors, flavors
- Artificial preservatives and toxins
- High Fructose Corn Syrup (HFCS) and agave
- Diet and regular sodas and juice drinks (punch)
- Hydrogenated oils / trans fatty acids / margarine
- All deep fried foods
- Sugar and caffeine
- Refined grains
- Processed foods
- Craved foods
- Any food that is a problem

CHOICES WITHIN FOOD GROUPS

Protein	Fat	Carbohydrate
Animal Source Seafood Meats Poultry Eggs Milk products **Plant Source** ***Fiber*** Beans Nuts Seeds	**Saturated Fatty Acids** **Unsaturated Fatty Acids** ▪ **Monounsaturated** • **Omega-9** olive, avocado, almond ▪ **Polyunsaturated** • **Omega-6** *Essential* vegetables and oils • **Omega-6** *Essential* fish, fish oil, algae beans, nuts, seeds	***Fiber*** Vegetables Fruits Grains Beans Nuts Seeds

BASIC ORGANIC SQUARE MEAL

Age	Calories/Day	Protein Grams/Day	Fiber Grams/Day	Water Ounces/Day
2 to 3	1000 to 1400	20 to 25	15	30 to 35
4 to 6	1200 to 1800	25 to 35	15 to 19	40 to 45
7 to 11	1200 to 2000	35 to 45	15 to 20	45 to 60
12 to 17	1600 to 2400	45 to 60	20 to 25	55 to 60
Adult Female	2000 to 2400	60 to 75	25 to 30	60 to 75
Adult Male	2400 to 3000	75 to 90	30 to 35	70 to 90

High Fiber Vegetables
Eat with other food or on empty stomach
1 to 3 cups/day or more
Eat More: green, orange, red, purple

AVOID
Artificial additives
Artificial sweeteners
Preservatives, coloring
Sodas: diet and regular
HFCS – corn syrup
Hydrogenated oils
Refined foods
Fried foods
Deli Meat
Caffeine
Sugar

More vegetables

Choose a wide variety of color, textures and flavors

Protein at every meal/snack

Optional: fruit, starch, grain

Protein
8 grams protein =
1 oz meat, fish, poultry, cheese
1 large egg
1/3 C Greek yogurt
1/3 C cottage cheese
1/2 cup beans
1/2 cup nuts, seeds
2 Tbs nut butters

Fruit, Starch, Grains
Not on an empty stomach
Eat Less Breads, Pasta
Bagels, Cold Cereals
Starches, Juices
Eat
Whole Grains 1 to 6 servings
Fermented Foods
Fruit 1 to 2.5 /day

Drink: Water Green and Herb Teas Seltzer w/ juice.
Sweeteners: Juice, maple syrup, honey, stevia
Oils: Flaxseeds ground, olive, avocado, coconut, almond

IF IT DOES NOT GROW……DO NOT EAT IT!

Nutrient-Dense, Eco-Friendly

- Pasture-fed, grass-fed animals
- Eggs, seafood, meat, poultry
- Beans, nuts, seeds
- Homemade bone broth (pasture fed)
- Vegetables and fruits
- Fermented vegetables, fruits, beverages
- Whole ancient grains (soaked, sprouted, fermented)
- Celtic sea salt
- Filtered water
- Raw vegetable juices

Good Fats and Oils

- Extra virgin olive oil
- Butter
- Animal fats
- Coconut oil
- Expeller pressed sesame, flax oils

Natural Sweeteners (limit)

- Honey, maple syrup
- Natural juices
- Stevia

- Dufault R, Schnoll R, et alBehav Brain Funct. 2009 Oct 27;5:44.
- Lu C, et a.. Environ Health Perspect 2006; 114(2): 260-263.
- McCann D. et al. Lancet 2007; 370(9598): 1560-1567.
- Fallon. Nourishing Traditions Weston A. Price Foundation

HEALTHY NATURAL DIET BASICS

- The first food or drink of the day sets the glucose standard for the day. Have protein and fiber first!
- Protein, fiber and good fat stabilize blood glucose control, mood, attention and endurance.
- Increase fiber:
  - Vegetables, fruits, nuts, seeds,
  - Whole ancient grains (oatmeal, brown rice, quinoa, teff, kamut amaranth, spelt)
  - Add guar gum: 1 Tbs = 4 grams of fiber.
- Organic is more nutritious and reduces the load of harmful additives, pesticides and chemicals.
- Low fat and “lite” foods are usually glycemic and can increase hunger, triglycerides and weight.

HEALTHY DRINKS

- Water – main source of fluids
- Diluted fruit juice – use 50-90% water
- Vegetable juice – homemade/fresh pressed or Vruit juice
- Organic cow milk, almond, coconut, hemp, rice
- Homemade smoothie in meals/snacks
- Fermented teas (Kombucha)
- Seltzer with “real” juice to flavor
- Coconut water with juice to flavor
- Fruit/vegetable juice smoothies

SUMMARY OF DIET GOALS

Daily Intake	Age 2 to 3	Age 4 to 6	Age 7 to 11	Age 12 to 17	Adult Female	Adult Male
Calories	1000 - 1400	1200 - 1800	1200 - 2000	1600 - 2400	2000 – 2400	2400 - 3000
Protein *Grams*	20 – 25	25 – 35	35 – 45	45 – 60	60 – 75	75 - 90
Veggies *Cups*	1	1.5 – 2	2	2 – 3	3 – 3.5	3 – 3.5
Fruits *Cups*	1	1 – 1.5	1.5 – 2	2 – 2.5	2 – 2.5	2 – 2.5
Grains * *Ounces*	0 – 3	0 – 4	0 – 5	0 – 6	0 – 7	0 – 8
Fiber *Grams*	5	15 – 19	15 – 20	20 – 25	25 – 30	30 – 35
Water *Ounces*	30 – 35	40 – 45	45 – 60	55 – 60	60 – 70	70 – 90

***Grain - 1 ounce equivalents** = 1/2 C cooked rice, cereal, pasta
1 slice bread or 1 small muffin
1C cold cereal flakes (organic)

PROTEIN SERVING SIZES

Protein: 1 serving size =

- 1 palm for fish, fowl, meat

  Seafood – organic methods.
  Grass fed, pastured meats, poultry
  Egg servings – 1 to 2

- 1 cupped palm for nuts / seeds

  Organic, raw.

- 2 cupped palms for beans

Each person's palm size (flat or cupped) is the serving size.

PROTEIN SERVING SIZES

Include some protein at every meal and snack.

Age >	2 to 3	4 to 6	7 to 11	12 to 17	Adult F	Adult M
Grams/Day >	20 - 25	25 - 35	35 - 45	45 - 60	60 - 75	75 - 90
Grams/Meal>	6 – 8	8 – 12	12 - 15	15 - 20	20 - 25	25 - 30

8 Grams of Protein Is Found In…	
1 ounce	Seafood, Meat, Poultry, Cheese
1 Large	Egg
1/2 Cup	Beans, Hummus
1/4 Cup	Nuts, Seeds
2 TBSP	Nut Butter
1/3 Cup	Greek yogurt, Cottage cheese
1 Cup	Milk

THE GOOD EGG

- Has a high nutrient density to calories ratio
- High quality protein
- Contains vitamins A, E, D, Folic, B12
- Carotenoids: lutein and zeaxanthin
- Choline (nerve and brain growth)
- Does increase HDL
- Does NOT raise serum cholesterol significantly
- Does not cause heart disease

USDA. http://ndb.nal.usda.gov/ndb/foods/show/111
Rong y et al. Egg consumption and risk of coronary heart disease and stroke: BMJ. 2013 Jan 7;346:.
Qureshi A et al. Med Sci Monit 2007;13(1):CR1-8..
Kritchevsky. Egg consumption and coronary heart disease: J Am Coll Nutr. 2000 Oct 19 (5)549a.
McNamara. The impact of egg limitations on coronary heart disease risk. J Am Coll Nutr. 2000 Oct;19(5):540s

CHOLESTEROL IN AUTISM

- Cholesterol is necessary for brain structure and development.
- In autism, a subset of children have been found to have lower levels of cholesterol due to disorders of sterol metabolism.
- Cholesterol levels in a subset were found to be 100 mg/dL which is below the 5th centile for children over age 2 years. [1]
- Children with autism have significantly less cholesterol and GM1 (a ganglioside lipid) as compared to controls. [2]
- Dietary cholesterol supplementation improved growth, sleep quality, social interactions, autistic behaviors, aggression, infections, irritability, self-injury, outbursts and more. [3]
- Dose ranges /therapeutic trials: 20-300 mg/Kg body wt / day

1. Tierney et al. Am J Med Genet B Neuropsychiatr Genet. 2006 Sept 5;141B(6): 666–668.
2. Schengrund et al. Cholesterol, GM1, and autism. Neurochem Res. 2012 Jun;37(6)1201-7.
3. Aneja A and Tierney E. Int Rev Psychiatry. 2008 Apr;20(2):165-70

VEGETABLES, FRUITS, GRAINS

- **High fiber vegetables:** raw, juiced, steamed, in soups, smoothies, and purees added to spaghetti sauce and muffins.
- **Fruits:** whole fruits are best. Include them in smoothies. Avoid juices or dilute them. Use juice as a sweetener. Limit dried fruits to 1 Tbsp.
- **Grains:** cooked whole grains are best. Limit bread, pasta, crackers, pretzels, bagels

	Age 2 to 3	Age 4 to 6	Age 7 to 11	Age 12 to 17	Adult Female	Adult Male
Vegetables	1 C	1.5 - 2 C	2 C	2 - 3 C	3 - 3.5 C	3 - 3.5 C
Fruits	1 C	1 - 1.5 C	1.5 - 2 C	2 - 2.5 C	2 - 2.5 C	2 - 2.5 C
Grains *	0-3 oz	0-4 oz	0-5 oz	0-6 oz	0-7 oz	0-8 oz

*** Grain - 1 ounce equivalents =** 1/2 C cooked rice, cereal, pasta
1 slice bread or 1 small muffin
1C cold cereal flakes (organic)

ORGANIC FATS AND OILS

- Butter
- Coconut oil (raw or expeller pressed which is flavorless)
- Ghee
- Lard or tallow (grass-fed animals only)
- Earth Balance
- Spectrum Spread
- Palm fruit oil (not kernel)
- Olive oil, sunflower oil, avocado oil

Know Your Fats. Mary Enig Weston A. Price Foundation

Hippocrates said…

"Let thy food be thy medicine and thy medicine be thy food."

Good advice, but probably a lot easier to follow in 400 B.C. when he didn't have to contend with …

three McDonald's,

two Starbucks,

and a Cinnabon

within a five-mile radius of the Parthenon.

COMMON DEFICIENCIES AND DEFECTS

MINERALS	VITAMINS	OTHER
•Magnesium •Zinc •Selenium •Iron •Calcium	•Vitamin A •Vitamin D3 •Biotin •B Vitamins Folic, B12 B6, B2, B1	•Omega 3 EFAs •CoQ10 •TMG and DMG •Amino acids •Carnitine •Taurine, Glutathione

GENE AND GENE EXPRESSION	OTHER
•Methylation defects •Sulfation (detox) defects •MTHFR Deficiencies (folic/B12)	•Low cholesterol •Malabsorption •Toxic metals: mercury, lead, cadmium, copper

WHY IS DIET NOT ENOUGH?

- Gene variants, inborn or acquired errors in:
  - Digestion and/or absorption
  - Nutrient uptake, metabolism and/or utilization
  - Methylation, sulfation, detoxification
  - Cerebral folate
- Toxin accumulation which are nutrient antagonists
- Medications (e.g.) antacids lead to malabsorption
- Poor food choices: sugars, refined carbohydrates
- Food intolerances / reactions.
- Poor intake, self-limitation and picky appetite

TESTING

BLOOD	URINE	OTHER
•CBC w/ Diff •Chemscreen •Lipid panel •Iron, ferritin •RBC minerals •Toxic metals •Vit A, D3, E, K •Amino Acids •Carnitine •Fatty acids •IGF1, HbA1C •Allergies	•Organic acids for nutrient functions: vitamins, minerals, aminos, carbos, fatty acids, methylation, sulfation, oxidation, mitochondrial markers, neurotransmitters, •Urine toxic metals •Urine minerals •Bone resorption •Porphyrins: toxics •Opioid peptides from gluten, casein	•Stool: good flora, pathogens, parasites, markers for parasites, digestion, inflammation, fat malabsorption, inflammation, immunity (Sec IgA), toxic metals •Saliva Sec IgA, food antibodies, hormones •Hair (toxic metals) •Genetic Testing •Gene SNP testing 

NUTRIENT TERMINOLOGY

Natural forms are naturally occurring nutrients which:
- Are food based, extracted from foods, or food concentrates;
- Have lower potency and relatively higher absorption;
- Can require more substance to achieve high doses; and
- Can cause reactions depending upon food sources.

Artificial refers to non-natural nutrient forms which are:
- Not the forms best utilized by the body; and
- Can be much less effective or even ineffective; and
- Can be harmful, depending upon the nutrient form.

Synthetic forms are synthesized in the lab and:
- Contain active sites identical to the natural and artificial forms.
- Natural synthetics have higher potency and less volume; and
- Can be less expensive per dose amount.

NUTRIENT TERMINOLOGY

Elemental: nutrient amount available for absorption
- Zinc citrate is 35% elemental with a high bioavailability.
- Zinc oxide is 85% elemental with a low bioavailability.
- Bioavailability and physiologic function depend upon the form.

Absorption: nutrient amount which crosses the digestive tract
- Based on nutrient form, interactions, digestion and deficiency.

Bioavailability: nutrient amount available for function

Nutrient Function: physiologic utilization
- Depends upon form of the nutrient and cellular enzymes.

Homeostasis provides a wide safety range for supplements by regulating levels through absorption and excretion.
- Absorption increases in deficiency and higher need.
- Absorption decreases as tissue levels or function improve, and with excess intakes at one time.

RECOMMENDATIONS AND SAFETY

DRI/RDAs **D**ietary **R**eference **I**ntakes / **R**ecommended **D**ietary **A**llowances

- Determined by the Food and Nutrition Board (FNB) of the Institute of Medicine (IOM) of the National Academies
- Apply to "97% to 98% of healthy individuals" which is approximately 24% of the US population.
- Do not apply to approximately 76% of the population with: acute or chronic conditions, deficiencies, developmental delays, genetic issues, and gene variants.

Optimum is the nutrient intake goal for each individual.

For guidance, consult with a medical / nutrition practitioner

SUPPLEMENT REGULATION AND SAFETY

Dietary supplements are regulated as food by:

- FDA (Food and Drug Administration) under the Dietary Supplement Health and Education Act
- FTC (Federal Trade Commission)
- Government agencies in each state

FDA - Good Manufacturing Practices (GMP)

- Applicable to all pharmaceuticals and supplements

Reports (2009)	Adverse Events	Deaths
• Pharmaceutical	580,904	160,000 -190,000
• Supplement	1,275	0 - 10

Risk for death from supplements: 0.0001%

SUPPLEMENTATION PRINCIPLES

"Start low and go slow"

Supplementation is customized to the individual's needs: the "patient-specific DRI / RDA."

- Introduce supplements one at a time 3 to 7 days apart.
- The first supplement should be the one most likely tolerated.
  - Start with a lower dose and increase as tolerated.
  - If increasing causes problem, cut back or stop.
- Add additional supplements in the same manner.
- Progress takes time – stay the course!

For guidance, consult with a medical / nutrition practitioner

THE QUICK START: WHAT TO DO FIRST

Basic Diet: organic, nutrient dense, healthy, low glycemic

Supplements: with best overall benefit and fewest side-effects

Magnesium	• Mood, attention, focus, sensory, sleep
Vitamin D3	• Development, focus, mood, immunity, skin
Zinc	• Sensory, development, immunity, toxins
Omega-3	• Brain, behavior, vision, skin, inflammation
Probiotics	• Good flora, digestion, absorption, immunity
Multiple V M	• Specific to individual age and stage *

* With and without: vitamin A, B vitamins, copper, iron

CORE SUPPLEMENTATION

Listed in order based upon tolerance and effectiveness

TYPE	INFORMATION	TOTAL DAILY
1) Magnesium Calcium	Liquids, powders, caps With or without vit D3	Mg 100-250 mg Ca 250-800 mg
2) Vitamin D3	Liquids and micellized	400 – 2000 iu
3) Zinc	Acetate, picolinate, citrate, sulfate, chloride	10 - 30mg divided doses
4) Omega-3	EPA:DHA 1:2 ratio	500-2000 mg
5) Probiotics Biotin	Bifidus, mixed cultures GI good flora support	1-50 billion Biotin: 1 to10 mg
6) Multiple Vitamin and Mineral	With or without B vitamins vitamin A, copper, iron	As labeled As tolerated

MAGNESIUM DEFICIENCY

>400 MAGNESIUM DEPENDENT ENZYMES

- Mood and behavioral problems
- Hyperactivity
- Perseverations
- Anxiety, fears, emotional
- Constipation
- Hyperreflexia / easy startle
- Aggressive, defiant
- Memory, learning problems
- Poor endurance, yawning
- Sound and/or light sensitivity
- Insomnia, nightmares, terrors
- Poor calcium, bone loss
- Seizures

MAGNESIUM DEFICIENCY

Pregnancy

- Pregnancy nausea
- Preterm labor
- Hypertension
- Pre-eclampsia
- Miscarriage
- Premature birth
- Deficiencies: calcium
  potassium

Infant

- Apnea
- SIDS
- Irritability
- Prolonged startle reflex
- Poor sleep quality
- Infant seizures
- Febrile seizures

Pregnancy: 400 to 800 mg
Test: RBC Mg, OAT results

MAGNESIUM RECOMMENDATIONS

	DRI / RDA / AI	Therapy Range
0 to 12 months	30 to 75 mg (AI)	50 to 150 mg
1 to 3 years	80 mg	100 to 350 mg
4 to 8 years	130 mg	100 to 600 mg
9 to 13 years	240 mg	300 to 750 mg
14 to >30years	M 410 mg F 320 mg	350 to 750 mg
Pregnancy	350 to 400 mg	400 to 800 mg

- Low toxicity. Excess causes diarrhea which depletes Mg.
- Least stool effect: glycinate, chelate, aspartate, gluconate.
- Most stool effect: citrate, chloride (good for constipation)

Tests
RBC Mg WBC Mg Mg Load Test Kinase Deficiencies
Serum / plasma magnesium is not valid for tissue status

MAGNESIUM and CALCIUM

Guidelines on Magnesium Supplementation

- For constipation: citrate, chloride
- For less stool effect: chelate, aspartate glycinate, gluconate

MAGNESIUM	TOTAL DAILY DOSE Magnesium up to 600 mg
Magnesium • Powders, caps, liquids	100 mg to 200 mg q.d. to t.i.d.
Ca : Mg 2:1 to 1:1 ratio	**TOTAL DAILY DOSE Ca to 800 mg Mg to 600 mg**
Calcium magnesium citrate with D3 GFCFSF Liquid or powders	Ca 300, Mg 150, D 200 Frequency: q.d to b.i.d. am/pm *(excess Ca is pro-inflammatory)*

Diet Sources: greens, vegetables, beans, nuts, seeds

CALCIUM DEFICIENCY

Fetus / Infant

- Shortened gestation
- Low birth weight

Child

- Muscle cramps
- Seizures
- Tremors
- Insomnia
- Anxiety
- Bone loss
- Positive Chvostek

➢ Mg deficiency precedes Ca deficiency

➢ Mg and D3 are critical to Ca utilization.

CALCIUM SUPPLEMENTS AND SOURCES

Calcium	RDA / TX mg	UL
0 to 1 yr	210 to 250	-
1 to 3	700	2500
4 to 8	800	2500
9 to 18	800 to 1300	2500
Adult	800 to 1200	2500
Preg	1300	2500

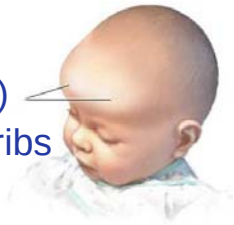
Substitutes For 300 mg Ca in 1 Cup Milk	
1 C	Rice or coconut milk fortified
1 C	Hemp or almond milk fortified
1.3 C	Tofu (if tolerated)
5 oz	Salmon canned w/ bones
2 ½ oz	Sardines canned w/ bones
2 ½ -3 C	Green leafies, broccoli

Supplement	Solubility	Taste	Texture	Absorption	Other
Citrate	Good	Neutral	Chalky	Excellent	Acidic
Chelates	Moderate	Sweet	Varies	Excellent	Neutral
Carbonate	Good	Neutral	Chalky	Good	Alkaline

Test: Serum calcium, serum ionized calcium

VITAMIN D DEFICIENCY: CLINICAL CLUES

- Late-closing fontanels
- Deformed skull (bossing)
- Enlarged knees, wrists, ribs
- Bowed legs
- Developmental delays
- Learning disabilities
- Low tone
- Rashes, eczema, dermatitis
- Chronic chapped lips
- Delayed tooth eruption
- Profuse sweating



VITAMIN D

VIT D	INTAKE IU	UL(IU)
0 to 1	400 or more	1,500
Child	600 – 2,000	3,000
Adult	1,000 – 8,000	>10,000
Preg	1,000 – 4,000	>5,000

SUPPLEMENTS

Vitamin D3 Cholecalciferol
Fish oil and micelized liquids
Vitamin D2 Ergocalciferol
Less effective long term

LAB TESTS

25 OH D3: 40 -100 ng/ml (60-80)
Deficiency: H Alk Phos, Low PTH

SOURCES OF D	IU'S
1 tbsp. Cod liver oil	1,360
3.5 oz fish	360
1 can sardines	250
1 egg (yolk)	20
Milk/ milk substitutes	100
Full sun 20 minutes	10,000

TOXICITY

> 20,000 iu daily for months.
Not from sun exposure.
Self-limiting.
Avoid in Sarcoidosis

ZINC FUNCTIONS

>350 ZINC DEPENDENT ENZYMES

- Gene expression
- Cell membrane structure, function, stability
- Epithelial integrity: skin, mucosal membranes
- Retinal binding protein RPB (carrier for vit A)
- Growth and development
- Brain pruning and toxic metal metabolism
- Sensory development and function

Vision Auditory Smell Taste Touch Processing

ZINC DEFICIENCY: CLINICAL CLUES

BRAIN PRUNING, SENSORY, GROWTH AND DEVELOPMENT

Motor Planning

Low Tone

Toxic Metal Accumulation

Poor Amino Acid Utilization

Frequent Illness

Ear Infections

Growth Delays

Failure To Thrive

ZINC DEFICIENCY

ACRODERMATITIS ENTEROPATHICA

- Occurs after weaning from breast milk
- Breast milk zinc is well absorbed – formula zinc is not.
- Leads to immune disorders, developmental delays.
- Deficiencies of biotin, A, D, and omega-3 contribute!

ZINC DEFICIENCY: CLINICAL CLUES

- Picky appetite especially for vegetables
- Pica (eating non-food substances)
- Sensory Integration Disorder
- Poor eye contact
- White lines on fingernails
- Growth and language delays
- Eczema, dermatitis
- Low muscle tone
- Inflammation, infections
- Low alkaline phosphatase
- Elevated toxic metals (mercury, lead)

ZINC TALLY TASTE TEST

Zinc Tally Test	Instructions
Place 2 tsp. in the mouth	It can be swallowed
Response in 5 seconds	Patient describes taste or Infant: observe reaction

Patient Response	Interpretation
No taste or tastes like water	Poor zinc
Tastes dry, not water taste	Moderate zinc
Tastes strong, metallic	Excellent zinc

The solution is dilute zinc sulfate and safe to use on children

ZINC SUPPLEMENTATION

Zinc total daily intake – all sources: 15 to 45 mg

FORMS	TASTE	COMMENTS
Gluconate	Neutral	Well tolerated
Citrate	Tangy, sour	Avoid if H citrate
Picolinate	Bitter	Tolerance varies
Chelate, Acetate	Neutral to sour	Well tolerated
Chloride	Neutral	Well tolerated
Sulfate	Strong (sulfur)	Gastric discomfort

Best availability on empty stomach or small snack
- Limit to 15 mg if taking on an empty stomach

Large doses – best separated from:
- DPPIV, calcium, iron, folate, phosphorylates

Zinc Tally taste test – screening test

ZINC RECOMMENDATIONS

For those with maldigestion, malabsorption, toxic metals, and/or defects in metabolism - the following applies.

	DRI / RDA	Therapy	Toxicity
2 to 5 yrs	2 to 3 mg	5 to 15 mg	
3 to 8 yrs	3 to 4 mg	15 to 45 mg	>150 mg
ASD child	2 to 12	20 to 45 mg	
13 to Adult	8 to 11 mg	25 to 80 mg	>150 mg
Pregnancy	11 to 12 mg	20 to 40 mg	150 to 450 mg

Zinc Testing

- RBC Zinc or WBC Zinc
  Serum/plasma Zn unreliable
- Taste test (zinc sulfate solution)
- Abnormal metallothionein fx
- Alk phos low in deficiency
- Hair (screening tool)

Test copper (serum, RBC) to prevent copper depletion

OMEGA-3 ALA, EPA, DHA

- US intakes are among the lowest in the world
- Low conversion from ALA alpha-linolenic acid (vegetable source) to EPA and DHA (seafood and algae source)
- Blockers to absorption and/or utilization:
  - Margarine / trans fatty acids!!
  - Low fat diets
  - Bile acid sequestrants
  - Excess omega-6 intake
- Highest needs are all stages:
  - Fertility, prenatal, infancy
  - Children, adults, elderly

OMEGA-3 ESSENTIAL FATTY ACIDS

EPA [eicosapentaenoic acid] dominant symptoms

- Skin: dry, rashes, eczema, dermatitis, seborrhea
- Frequent urination and excess thirst
- Impaired fetal and child growth and development
- Immune dysfunction, inflammation

DHA [docosahexaenoic acid] dominant symptoms

- Brain and retinal development and function
- Impaired cognition
- Vision dysfunction and poor eye contact
- Neurological symptoms
- Mood, behavior and attention disorders

OMEGA-3 SEAFOOD SOURCES

AVOID / LIMIT		SAFER CHOICES
Bass (largemouth)*	Marlin*	Blue crab (mid-Atlantic)
Bluefish	Monkfish	Croaker fish sticks
Blue crab (gulf)	Oysters (gulf)*	Flounder (summer)
Croaker (white)*	Pike*	Haddock
Flounder	Sea bass	Mussels
Halibut*	Shark*	Salmon (wild Pacific)
King mackerel*	Sole	Sardines
Lake whitefish	Swordfish*	Shrimp
Largemouth bass	Tilefish*	Trout
Mahi mahi	Tuna albacore*	Tuna (light)

* Strict avoidance in pregnant women, infants, and children

www.epa.gov/waterscience/fish/ www.EWG.org

OMEGA-3 EPA DHA

EPA + DHA Total 500 – 3000 mg EPA:DHA 1:1 to 1:2

Type	Dose	EPA mg	DHA mg	Vit D IU	Vit A IU
Pro-Omega D Xtra Nordic Naturals	½ tsp.	1000	500	500	0
Carlson's Very Finest Fish Oil	1 tsp.	800	500	0	0
Kirkman CLO w/ or w/o D and A	½ tsp.	250	250	250/0	0/2500
Omega Cure (unflavored)	1 tsp..	400	600	Trace	350 - 500
Baby DHA Nordic Naturals	4 ml	328	480	250	340 -1200
Ocean Blue Omega-3 Minicaps (w or w/o D3)	1 caps	225	200	1000/0	0
Neuromins ® DHA *Algae /vegetarian*	1 ml 1 caps	0 0	200 280	0 0	0 0

PROBIOTICS

Probiotics

- 10 trillion human cells to 100 trillion bacteria
- Gut flora support systemic and digestive immunity
- Prebiotic non-digestible complex fiber - fuel for probiotics
- Manufacture vitamins: biotin, vitamin K
- Improve digestion, absorption and reduce inflammation

Deficiency Symptoms

- Bloating, gas, reflux, dysbiosis, diarrhea
- Poor absorption
- Skin rashes, eczema
- Oral thrush, yeast overgrowth
- Immune dysfunction and infections

Tongue: thrush

Sources and Supplements

- Fermented foods: coconut kefir, sauerkraut, kombucha
- Supplements: Infant: 5 to 10 billion Child: 10 to 20 billion

BIOTIN

Deficiency Symptoms

- Fatty acid defects
- Developmental delays
- Dermatitis, eczema, seborrhea
- Thrush, yeast overgrowth
- Seizures, acidosis
- Hair: dull, fly-a-way, poor growth

May also be symptoms of low:

- Omega-3, zinc
- Vitamins A and D

Test

- OAT: β-Hydroxyisovalerate

Sources

- Produced in GI tract by flora
- Antagonists: antibiotics
- Dosing: 1 mg to 10 mg
- Non toxic

PROBIOTICS and BIOTIN

Infant: 5-10 billion Child: 10-20 billion Adult: 20-100 billion

Probiotics	CFUs*	Comments
UltraBifidus Dairy Free *Metagenics*	½ teas: 15 billion	Best for infants
Bifido Complex Advanced Insulin-free *Kirkman*	1 caps: 15 billion	Infants, SCD
Therbiotic Infant Formula *Klaire Labs*	1 caps: 30 billion	For formula fed infants
Pro-Bio Gold w/ or w/o inulin *Kirkman*	1 caps: 20 billion 1 wafer:20 billion	Comprehensive
Pro-5 *Klaire Labs*	1 caps: 25 billion	Comprehensive

* CFUs = Colony Forming Units

Biotin	OTC or compounded: 1 to 10 mg

MULTIPLE VITAMIN MINERAL

- General
  - Baseline which does not cover all nutrient needs
  - The more complete, the less additional supplements needed
  - High quality, pure, organic, GMP manufacturing standards
  - No artificial additives, coloring, binders, preservatives
- Appropriate to the individual's:
  - Age, stage and tolerance of liquids, powders, caps, tablets
  - Gene variants and medical conditions
  - Clinical presentation and laboratory findings
  - Food or substance allergies / intolerances
  - Special diet: GFCFSF, SCD, Low phenol, Low oxalate et al
  - Limitations: vitamin A, B vitamins, iron, copper and others
- Additional supplements
  - OTC and/or
  - Compounded by a pharmacist - individualized, filler-free
    Limits total substance required and improves compliance

MULTIPLE VITAMIN MINERAL

Type	Age	Daily with Meals
Syndion by Yasoo Caps or powder	2 to 3 4 to 7 8 on	2 caps or ½ tsp. 3 caps or ¾ tsp. 4 -5 caps or 1 – 1 ¼ tsp.
Children's Multi-Vitamin Mineral Hypallergenic Kirkkman Labs	2 to 5 6 to 10 11 on	1 caps per day 1 caps 2 times / day 1 caps 3 times / day
VitaSpectrum Multiple for Children with ASD Klaire Labs	2 to 5 6 to 10 11 on	1 caps 1 to 2 times/day 2 caps 2 times / day 1 caps 3 times / day
Everyday Multi-Vitamin Mineral Hypoallergenic w and w/o A and D Kirkman Lab	2 to 5 6 to 10 11 on	1 caps 1 to 2 times/day 2 caps 2 times / day 1 caps 3 times / day

OTHER IMPORTANT NUTRIENTS

- Vitamin A
- Vitamin E
- B Vitamins especially: B6, B12, folinic
- Vitamin C
- Iron
- Copper
- Selenium
- CoEnzyme Q10

VITAMIN A DEFICIENCY: CLINICAL CLUES

- Night blindness
- Poor vision, eye contact
- Inflammation, infections
- Dry eyes, dry skin

Acne

Eczema, Dermatitis

Ridged Nails

Keratosis Pilaris
"Chicken Skin"

Face

Arm

FOLATE

Deficiency Symptoms

- Neural tube defects
- Failure to thrive
- Risk for ASD
- Developmental delays
- Impaired cognition
- Language delays
- Depression, fatigue
- Glossitis / geographia

Supplement Doses

Folinic 500 mcg to 3 mg
Not folic acid

Tests / Deficiency

- FIGLU (high)
- Homocysteinemia
- Macrocytic anemia
- MTHFR defects
- Hypomethylation

TREATMENT BY SYMPTOMS

The ADHD and Autism Nutritional Supplement Handbook:

- Outlines 18 of the most common physical and behavioral symptoms seen with ADHD and autism
- Lists most common nutritional contributing factors
- Gives associated symptoms to help guide supplement choice
- Provides dosing guidelines for supplements

TONGUE: COATED, GEOGRAPHIC, SORE

COATED TONGUE

- Probiotics: 50 billion
- Biotin 5 to 10 mg
- Fiber and fermented foods

GEOGRAPHIC TONGUE

To the above recommendations add:

- Digestive enzymes w/ demulcents
- B Complex: 10 to 25 mg
- Sublingual methyl B12: 1000 mcg

SORE RED TONGUE (LOW NIACIN)

To the above recommendations add:

- Niacinamide 50 to 250 mg
- Iron if deficient 10 to 60 mg

PICKY EATING

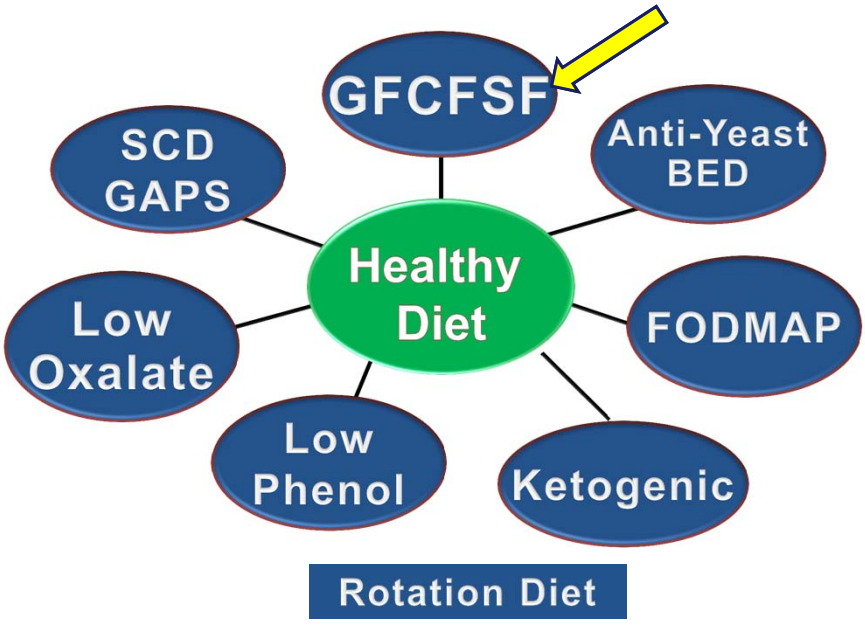
Supplements Based on Findings and Symptoms

- Zinc 15 to 45 mg total daily intake in divided doses
- Probiotics 50 billion
- Reduce toxins with sulfation support
  - Taurine: 50 to 250 mg based on testing
  - Mg Sulfate Cream
  - or Epsom salts and soda baths
- Rice-based medical food for GI tract

Diet Based on Symptoms and Findings

- GFCFSF and DPP-IV enzymes
- Note: high consumption of milk reduces appetite
- Feeding therapy

SPECIAL DIETS AS NEEDED



GFCFSF CHOICES IN FOOD GROUPS

Protein	Fat	Carbohydrate
Animal Source Seafood Meats Poultry Eggs X Milk products **Plant Source** ***Fiber*** Beans X Soy Nuts Seeds	**Saturated Fatty Acids** **Unsaturated Fatty Acids** ▪ **Monounsaturated** • **Omega-9** olive, avocado, almond ▪ **Polyunsaturated** • **Omega-3** *Essential* fish, beans, nuts, seeds • **Omega-6** *Essential* vegetables and oils	***Fiber*** Vegetables Fruits Grains X Gluten Beans X Soy Nuts Seeds

GFCFSF ORGANIC MEAL

Age	Calories/Day	Protein Grams/Day	Fiber Grams/Day	Water Ounces/Day
2 to 3	1000 to 1400	20 to 25	15	30 to 35
4 to 6	1200 to 1800	25 to 35	15 to 19	40 to 45
7 to 11	1200 to 2000	35 to 45	15 to 20	45 to 60
12 to 17	1600 to 2400	45 to 60	20 to 25	55 to 60
Adult Female	2000 to 2400	60 to 75	25 to 30	60 to 75
Adult Male	2400 to 3000	75 to 90	30 to 35	70 to 90

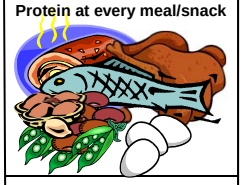
High Fiber Vegetables
Eat with other food or on empty stomach
1 to 3 cups/day or more
Eat More: green, orange, red, purple

AVOID
Artificial additives
Artificial sweeteners
Preservatives, coloring
Sodas: diet and regular
HFCS – corn syrup
Hydrogenated oils
Refined foods
Fried foods
Deli Meat
Caffeine
Sugar

More vegetables

Choose a wide variety of color, textures and flavors

Protein at every meal/snack



Optional: fruit, starch, grain

Protein
8 grams protein =
1 oz meat, fish, poultry,
1 large egg
1/2 cup beans
¼ cup nuts, seeds
2 Tbs nut butters
NO MILK, CASEIN, SOY

Fruit, Starch, Grains
Not on an empty stomach
Eat Less Breads, Pasta
Bagels, Cold Cereals
Starches, Juices
Eat
Whole Grains 1 to 6 servings
Fermented Foods
Fruit 1 to 2.5 /day
NO GLUTEN

Drink: Water Green and Herb Teas Seltzer w/ juice.
Sweeteners: Juice, maple syrup, honey, stevia
Oils: Flaxseeds ground, olive, avocado, coconut, almond

FOOD SOURCE OPIOID PEPTIDES

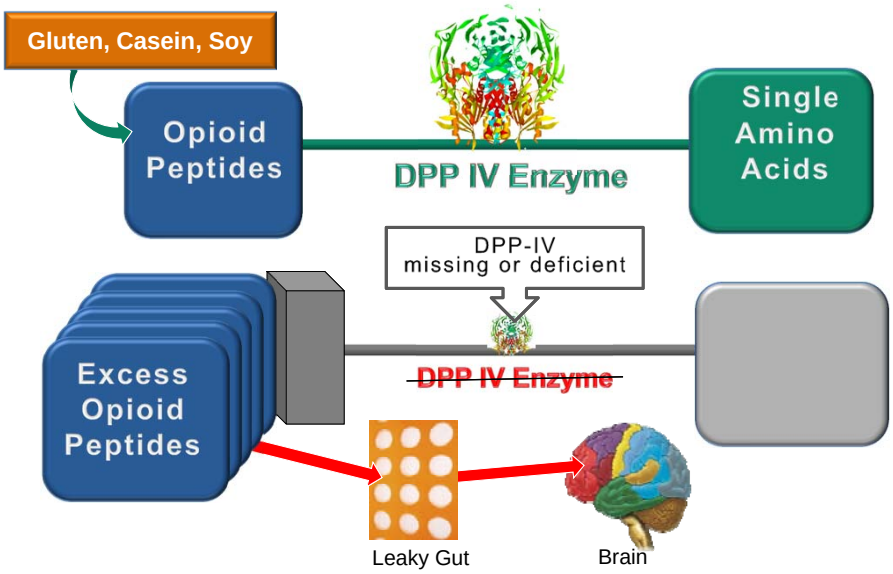
Gluten opioid peptides: Gliadorphin
tyr – pro – gln – pro – gln – pro – phe

Bovine casein opioid peptides: Casomorphin
Bovine Beta-Casomorphin 7 **bBCM-7**
tyr – pro – phe – pro – gly – pro – ile

Opiate-like (opioids) bovine BCM-7

- Occur with the intake of gluten, milk casein, and soy
- Are intended to function in the digestive tract for:
  - GI growth, motility, secretion, absorption, and
  - GI immunity and milieu (microbiome) health
- Can be absorbed if the gut is too permeable "leaky" and cross into the brain affecting mood and behavior

DIPEPTIDYL PEPTIDASE IV DPP-IV ENZYME



PROBLEMS WITH FOOD SOURCE OPIOIDS

Food source opiate-like peptides (opioids):

- Cause cravings / addictions to the food sources
- Are measureable in blood, urine, CSF, breast milk
- Are linked to

Autism	Postpartum depression
Infant SIDS	Mood and behavior disorders
Inattention	High pain tolerance
Aggression	Poor eye contact
Self-injury	Silly, “spacey” behavior
Picky eating	Increased stims

- K Reichelt, MD www.gluten-free.org/reichelt.html (bibliography)
- Whiteley and Shattock Expert Opin Ther Targets 6(2): 175. 2002.
- Deth, R. Int Soc for Autism Res, May 2010.
- Wasilewska et al. Neuropeptides. 2011 Jun;45(3):189-95.

GFCFSF:GLUTEN-FREE,CASEIN-FREE, SOY-FREE

The diet

- No glutens: wheat, oat, barley, rye, spelt, kamut
- No milk casein, milk products and soy

Underlying reasons for the diet

- DPP-IV deficiency and “leaky gut” allow gluten/casein opioid absorption via the digestive tract and uptake into the brain

Symptoms that suggest the diet may be helpful

- Craving: gluten, milk, soy
- GI: constipation, diarrhea
- Poor eye contact, attention
- Silly, “dopey” behavior
- OCD, self-injury, stims
- High pain tolerance

Recommendations and resources

- DPP-IV enzymes, probiotics, biotin, demulcents
- www.gfcfdiet.com and *Cooking To Heal* by Julie Matthews

ARE GLUTENS, MILK AND SOY ESSENTIAL OR NOT?

- **Grains, milk products and mature beans are not essential food groups**
  - They have been part of the human diet for only:
  - .005% of 2 million years of total human history
  - .05% of 200,000 years of modern human history
- They have not been part of the human diet for **99.995%** of human history
- They are **not required** food for humans – they are **options**
- Grains, milk products and beans are choices within the 3 food groups:
  - **Glutens** and other **grains**, are **carbohydrate** choices
  - **Milk products** are a **protein** choice
  - **Soy** and other **beans** are **protein** and **carbohydrate** choices
- The following must be maintained
  - Calories – Protein - Nutrients (including calcium, magnesium and D)

LOW PHENOL / SALICYLATE / FEINGOLD / FAILSAFE

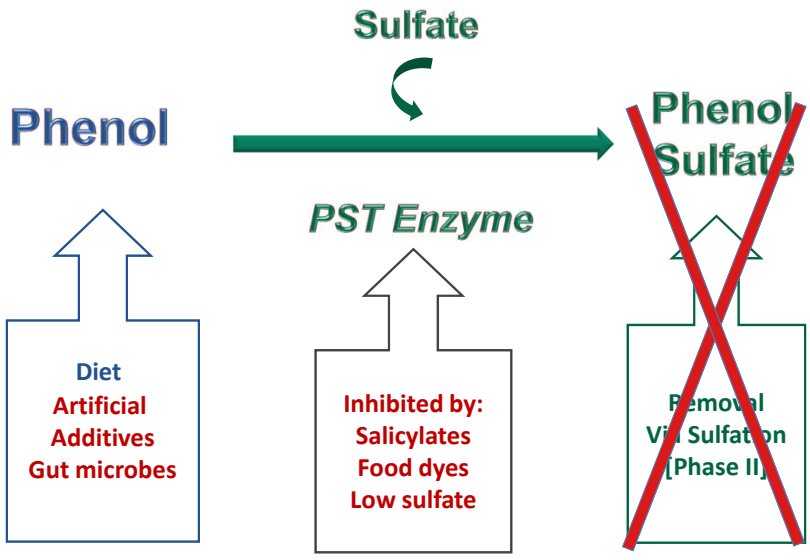
The diet
- No artificial additives, preservatives, excitotoxins
- Avoid phenolic foods (grapes, apples, berries)

Underlying reasons for the diet
- Defective phenol sulfotransferase PST and sulfation.
- Poor flora results in poor clearance of phenolics

Symptoms that suggest the diet may be helpful
- Red cheeks and ears
- Aggression, regressions
- Hyperactivity, silly
- Night sweats

Recommendations and resources
- Low phenol diet; digestive enzymes, probiotics, biotin, sulfate (taurine, cysteine, MSM).
- www.feingold.org www.failsafediet.wordpress.com

PHENOL SULFOTRANSFERASE PST



ARTIFICIAL FOOD ADDITIVES

Avoiding Salicylates: 5-Year-Old Girl With ADHD

On Artificial Additives Coloring, Preservatives	Organic Feingold Diet After 1 Week	Organic Feingold Diet After 2 Weeks
		
Processing Therapy Recommended	Coloring Within The Lines	Processing Therapy Not Needed

SCD: SPECIFIC CARBOHYDRATE DIET
GAPS: GUT AND PSYCHOLOGY SYNDROME

The diet

- No disaccharides: lactose, sucrose, maltose, isomaltose
  Found in: grains, beans, dried fruit, starches, milk products

Underlying reasons for the diet

- Deficient: lactase, sucrase, maltase, isomaltase.

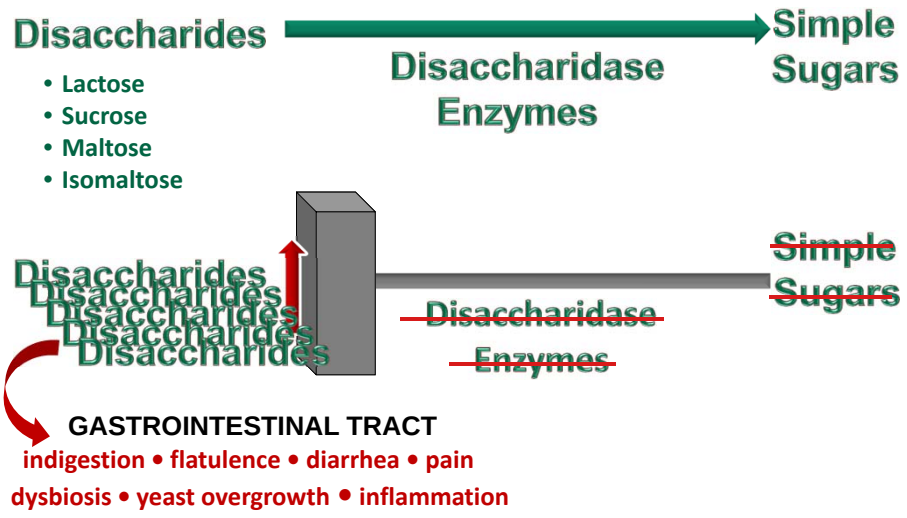
Symptoms that suggest the diet may be helpful

- Persistent: gas, bloating, diarrhea, yeast overgrowth.
- Symptoms worse with disaccharides

Recommendations and resources

- Meat, fish, eggs, nuts, non-starch vegetables, fruits,
- Disaccharidase enzymes, probiotics, biotin. Celiac?
- www.breakingtheviciouscycle.com scdiet.com gapsidet.com

DISACCHARIDASE ENZYMES AND SCD



ANTI-YEAST / CANDIDA, BODY ECOLOGY DIET

The diet
- No: sugars, refined grains, yeast, cheeses, breads

Underlying reasons for the diet
- Poor gut flora and yeast overgrowth from diet and/or medications such as antibiotics and steroids

Symptoms that suggest the diet may be helpful
- Digestive problems, dysbiosis, yeast overgrowth
- Itching: vaginal, rectal. Oral thrush. Problem stools.

Recommendations and resources
- Meats, seafood, eggs, beans, nuts, fiber vegetables
- Fermented foods: coconut kefir/yogurt, Kimchi, Kambucha
- Probiotics, biotin, anti-fungal herbs, garlic
- www.yeastconnection.com www.bodyecology.com

LOD: LOW OXALATE DIET

The diet
- Avoid: nuts, beans, greens, some grains and fruits

Underlying reasons for the diet
- Oxalates are made in the body, in the gut by fungi, and found in foods. Leaky gut allows absorption of the oxalates.
- Mg and B6 deficiency cause poor oxalate elimination.

Symptoms that suggest the diet may be helpful
- Inflammation and pain persist
- Chronic bowel dysbiosis
- Regression after oxalates
- Bed wetting
- Sandy stools
- Kidney stones

Recommendations and resources
- Low oxalate foods: www.lowoxalate.info
- Probiotics, biotin, magnesium, vitamin B6/P5P, demulscents, A, zinc

THE FODMAP APPROACH: AN OVERVIEW

Fermentable **O**ligo-, **D**i- and **M**ono-saccharides, **A**nd **P**olyols

The diet

- Avoidance of short-chain carbohydrates, polyols (sugar alcohols)

Underlying reasons for the diet

- Fermentable carbohydrates and polyols which are poorly digested and absorbed in small intestine and proximal colon.

Symptoms that suggest the diet may be helpful

- When there are persistent digestive problems: bloating, gas, distension, abdominal pain, irregular stool quality.

Recommendations and resources

- Probiotics, biotin, vitamin A, zinc, omega-3
- www.fodmapsdiet.com www.ibs-free.net

ROTATION DIET

The diet

- Avoids repetition of foods based on food families for a 4 day or 7 day rotation.

Underlying reasons for the diet

- Multiple food reactions and poor digestion render complete avoidance too difficult.

Symptoms that suggest the diet may be helpful

- Multiple food reactions and few non-reactive foods.
- Digestive and/or immune problems persist.

Recommendations and resources

- Rotation diet: 1 food or food family 4 to 7 days apart.
- Probiotics, biotin, broad digestive enzymes
- Dr. Sally Rockwell: www.drsallyrockwell.com

KETOGENIC DIET AND MCT KETOGENIC DIET

The diet
- High fat, adequate protein, low-carbohydrate diet.

Underlying reasons for the diet
- To establish ketosis in the body, for ketones to replace glucose as brain fuel – reducing seizures.

Symptoms that suggest the diet may be helpful
- Seizure disorders not responsive to other treatments.

Recommendations and resources
- 4:1 ratio is [Ketogenic fat] to [Anti-Ketogenic protein + carbohydrate]
- MCT diet variant: coconut oil = 50% of calories
- Nutritional supplements (therapeutic)
- Freeman, Kossoff et al. "Ketogenic Diets." 5th Ed, 2011

NUTRIENT: DEFICIENCIES, TESTS, DOSES

Nutrient	Symptoms	Tests
Vitamin A *1000-3000 iu*	Keratosis pilaris (gooseflesh) night blind, poor vision, dry eyes, dry skin, eczema, dermatitis	Serum vitamin A RBP Dark adaptation
Vitamin C *100–3000 mg*	Bruising, infections, anemia, folate deficiency, cervical dysplasia	WBC C, plasma C
Vitamin D *400-5,000 iu*	*Produced in skin from sun UV light* Bone loss, bowed legs, bulging forehead, delays, XS sweating	Vit D 3 25 OH H Alk Phos L PTH
Vitamin E *50–200 iu*	RBC fragility, H bilirubin, infertility weak muscles, infant jaundice	Serum vit E Lipid perox
Vitamin K *150-1000 mcg*	*Produced in GI tract flora* Osteoporosis, periodontitis, bleeding	Phylloquinone Prothrombin time
Omega 3 *500-3000 mg*	Eczema, infertility, ADHD, moods cognitive and developmental delays	RBC membrane L ALA, EPA, DHA

NUTRIENT: DEFICIENCIES, TESTS, DOSES

Vitamins	Symptoms	Tests
B1 *5-100 mg*	Sensory motor, pica, calf tender	ETK transketolase
B2 *5-100 mg*	Dermatitis, cheilosis, glossitis hair loss, poor growth, L B6, FA	EGR reductase H FA metabolites
B3 *amide 50-1000 mg*	Dermatitis, diarrhea, dementia red neck. glossitis, sore tongue	Urine 1-N-methyl nicotinamide
B5 *50-1000mg*	Hives, burning feet, depression	Microbial assay
B6 *10-100 mg P5P 10-50 mg*	Microcytic anemia, preg nausea neurologic, glossitis, dermatitis,	Kynurenate,Xanthurenic Homocysteine (H)
B12 *0.5-5mg SubQ varies*	Neurologic, memory loss, glossitis! macrocytic anemia,	MMA, Homocysteine H MCV, MCH, L cobalt
Folate/folinic *0.5-3 mg Folinic not folic*	Neurologic, melasma, moods, macrocytic anemia, fatigue, cervical dysplasia,	FIGLU, RBC Folate Homocysteine H MCV, MCH, MTHFR

NUTRIENT: DEFICIENCIES, TESTS, DOSES

Mineral	Symptoms	Tests
Calcium *200-1000 mg Ca:Mg 2.1 - 1:1*	Bone loss, anxiety, HTN, seizures, cramps, tremors Without Mg, Ca is pro-inflammatory	Serum Ca, Ion Ca U pyridinolines
Magnesium *C 100-750 mg A 400-800 mg*	Mood, memory, fatigue, HTN, H/A, seizures, yawning, startle, spasms, insomnia, brisk reflex, poor ATP	RBC Mg (not serum) H Quinolinate OAT Kinase function, Hair
Potassium *50 – 1000 mg (<5000 mg)*	Weak muscles, arrhythmias, lethargy, cramping, HTN, neuromuscular disorders	Serum potassium RBC potassium Hair
Zinc *Ch 5 –45 mg Ad 20–80 mg*	Poor growth, eczema, pica sensory dys, picky appetite A deficient, nail white lines	RBC Zn, WBC Zn Zinc Tally taste test MT, L Alk phos Not: serum or plasma
Iron *10 - 60 mg*	Pallor, fatigue, anemia, developmental delays, craving for ice chewing	Serum iron, IBC, %sat ferritin, RBC , Hct, Hgb MCV, MCH, MCHC

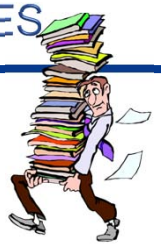
NUTRIENT: DEFICIENCIES, TESTS, DOSES

Mineral	Symptoms	Tests
Chromium *50–800 mcg*	Insulin resistance, synd X, poor collagen, neuropathy, Depleted by glycemic diet	RBC Cr, Hair (not serum)
Copper *0.25–2.5 mg **	Iron-resistant anemia.L WBC Cu SOD, thyroid,H chol/HDL ** Test Cu, Zn to determine dose*	Serum Cu, RBC Cu Ceruloplasmin,Hair Cu ESOD,XS Cu U
Manganese *1-10 mg* *usually < 5*	L SOD,CNS dysfunction, fatigue, tinnitus, tardive, insulin resist	RBC Mn, Mn ESOD H urine argin/ornith, Hair
Molybdenum *20-400 mcg*	Impaired sulfation, chemical sensitivity	L uric acid, L sulfate,
Selenium *25–150 mcg* *H dose if toxics*	Cardiomyopathy, L immunity GSH dysfunction, L sulfation	EGPX, RBC Se, Hair, Poor GSH High toxics (Hg)

NUTRIENT: DEFICIENCIES, TESTS, DOSES

Nutrient	Symptoms	Tests
Biotin *1 – 10 mg* *non-toxic*	*Produced in GI tract by flora.* Dysbiosis, yeast, eczema, delays, poor hair, seizures paresthesias, cradle cap	OAT: H β-Hydroxyisovalerate
CO Q 10 *Ch 25- 500 mg* *ASD 100-600mg* *Ad 75-600 mg*	DNA damage, muscle weakness, low tone, neuromuscular disorders, cardiomyopathy *Use ubiquinol*	L or H HMG urine L serum CoQ10 H OAT succinate, malate,fumarate,lactate
Choline *250–1,000 mg* *Use w/caution*	Cognitive decline L acetylcholine, methylation *Excess = fishy body odor*	Plasma choline
L-Carnitine *100 – 900 mg* *Use w/caution* *w/ tolerance*	Myopathy, poor endurance, mitochondrial dysfunction H triglycerides, fatty acid metabolism defects	OAT FA metabolites H Acylcarnitine L plasma carnitine R/o genetic defect

SUPPLEMENTATION RESOURCES



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RESOURCES ON DIET

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- The Encyclopedia of Dietary Interventions for the Treatment of
- Autism and Related Disorders *Karyn Serousi and Lisa Lewis*
- Special Diets for Special Kids and Special Diets for Special Kids 2 *Lisa Lewis*
- Cooking to Heal (NourishingHope.com) *Julie Matthews*
- Special Eats: Simple, Delicious Solutions (GFCF Cooking) *Sueson Vess*
- The Body Ecology Diet and Autism *Donna Gates*
- Digestive Wellness (2011). Digestive Wellness for Children (2006) *Liz Lipski*
- Breaking the Vicious Cycle (SCD) *Elaine Gottschall*
- Gut and Psychology Syndrome *Natasha Campbell-McBride*
- The Kid-Friendly ADHD & Autism Cookbook 2nd Ed (2009) *Compart, Laake*
- Fed Up (FAILSAFE Diet) *Sue Dengate*
- Nourishing Traditions *Sally Fallon (and Mary Enig)*
- Gluten-free cook books *Bette Hagman and by Carol Fenster*

AUTISM360™ LETTING THE DATA TALK

www.Autism360.org

Autism 360 is a site that …

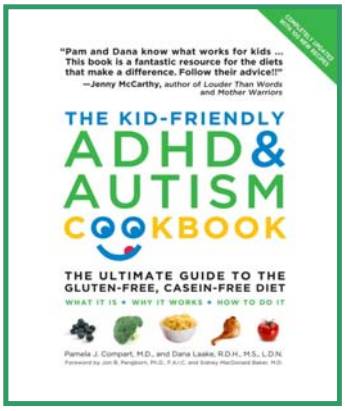
- Allows you to have a password protected record
- Provides the ability to track symptoms and progress
- Manages complex data on ASD patients
- Can be used to compare with others (anonymously)
- Gives the option to share data with your providers
- And….the service is free!

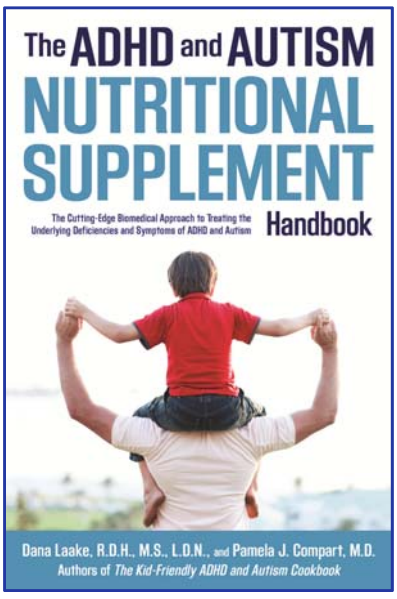
Moody's in the community

THE MOODY'S FOUNDATION

1500AM FEDERAL NEWS RADIO

www.FederalNewsRadio.com





These books are dedicated to the courageous children, and to all who love and serve them. We are humbled in your presence

AUTISM RESEARCH INSTITUTE
Autism is Treatable

The Quick Start

Tips for Introducing
Nutritional Supplements
and
Special Diets

Dana Laake, RDH, MS, LDN
Licensed Dietitian Nutritionist