Promises Hype and the Latest Research Findings Related to Autism and Diet

June 12, 2014

What are we going to cover?

- Research
- Diets
- Vitamin mineral absorption
- Omega 3 fatty acid supplementation
- GI problems
- Immune system
- Detoxification system
- Food allergies vs. sensitivities
- Picky eaters vs. problem feeders

- Formally a rare condition, the prevalence of autism has increased more than 10 fold in the past 20 years.

- CDC 2003 1 – 500
- CDC 2014 1 – 68

- CDC Autism Spectrum Disorder – Data & Statistics

Nutritional Strategies

- GFCF
- Dietary Supplements
- Omega 3 fatty acids

GFCF Diet

- One of the most popular diets.

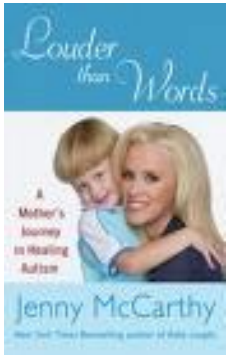
- Review of current literature in October 2013 Pediatric Review showed on the basis of review of the published literature, limitations in current data do not support the use of a gluten free casein free diet as a primary autism spectrum disorder treatment.

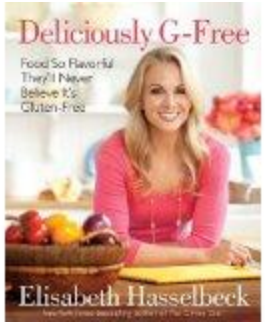
Pediatric review 2013 Oct:34(10)e36-41

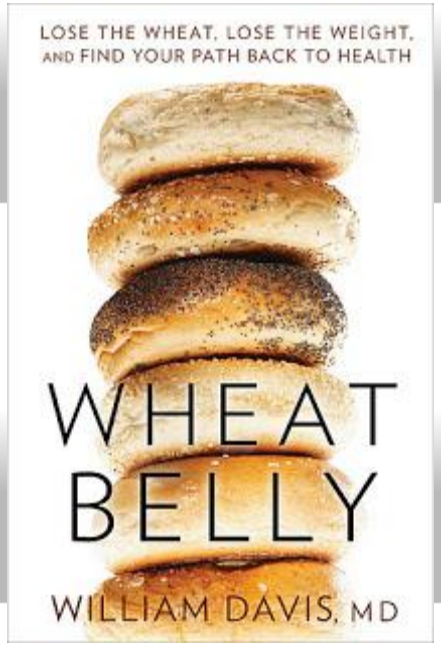
GFCF Diet

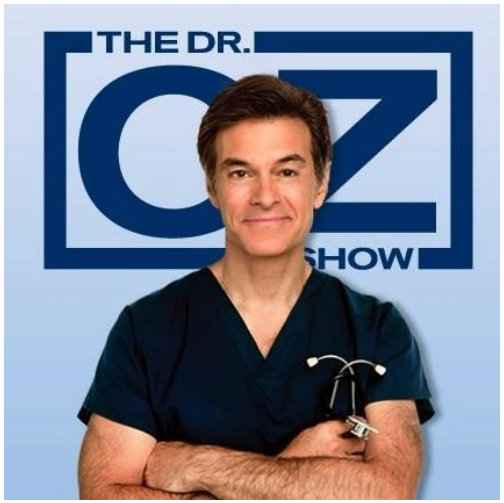
- Why does it continue to be promoted?
- Some children with autism spectrum disorder have reported to improve significantly when casein and gluten are removed from their diets.
- The number is small roughly 8%


THE
G
FREE
DIET


Louder than Words
A Mother's Journey to Healing Autism
Jenny McCarthy


Deliciously G-Free
Food So Flavorful They'll Never Believe It's Gluten-Free
Elisabeth Hasselbeck


LOSE THE WHEAT, LOSE THE WEIGHT,
AND FIND YOUR PATH BACK TO HEALTH
WHEAT
BELLY
WILLIAM DAVIS, MD


THE DR.
OZ
SHOW

Laughter, the Best Medicine

Definitions

- Celiac Disease – the ultimate in gluten intolerance. Body attacks itself in an autoimmune response to the exposure of gluten. Causes physical damage flattening of the intestinal villa. The intestinal wall appears smooth and lacks the bumpy finger like protrusions known as villa. A biopsy is considered the diagnosis for the disease.
- Estimated 1/100 non-Hispanic white have celiac disease
- A gluten free diet can take months or years to see improvement.

American Journal of Gastroenterology, July 31, 2012

Gluten Intolerance

- Produces antibodies when exposed to gluten.
- Same physical symptoms and complications associated with Celiac Disease.
- Villi are not damaged.

Gluten Sensitivity

- Affects 6-7 times more people than celiac disease.
- No test for Gluten Sensitivity.
- Exclusion of gluten results in problems going away. Inclusion, problems reoccur.
- On a gluten free diet improvement will be in a matter of days or weeks.

Symptoms

Chronic symptoms or complications associated with Celiac disease and gluten intolerance:

Abdomen

- Recurring intestinal problems that can include one or more of the following:
- Diarrhea
- Constipation
- Gas
- Acid reflux
- Cramping
- Stomach pain
- Stomach upset
- Bloating
- Problematic stools

Head

- Headaches
- Migraines
- Brain fog

Skin

- Itchy skin
- Rashes or blisters
- Eczema
- Mouth sores

Circulatory / Blood

- Anemia
- Malabsorption

Skeleton and Muscles

- Osteoporosis
- Osteopenia
- Bone/joint pain
- Muscle cramps
- Numbness or tingling in hands, feet
- Dental enamel problems
- Stunted growth in children

Reproduction

- Infertility
- Irregular menstruation
- Recurrent miscarriage

Spirit / Energy

- Chronic, unexplained fatigue
- Weakness
- Weight loss
- Irritability

Mental/Neurological

- Behavioral issues
- Seizures
- Depression
- Psychiatric problems

Autoimmune System

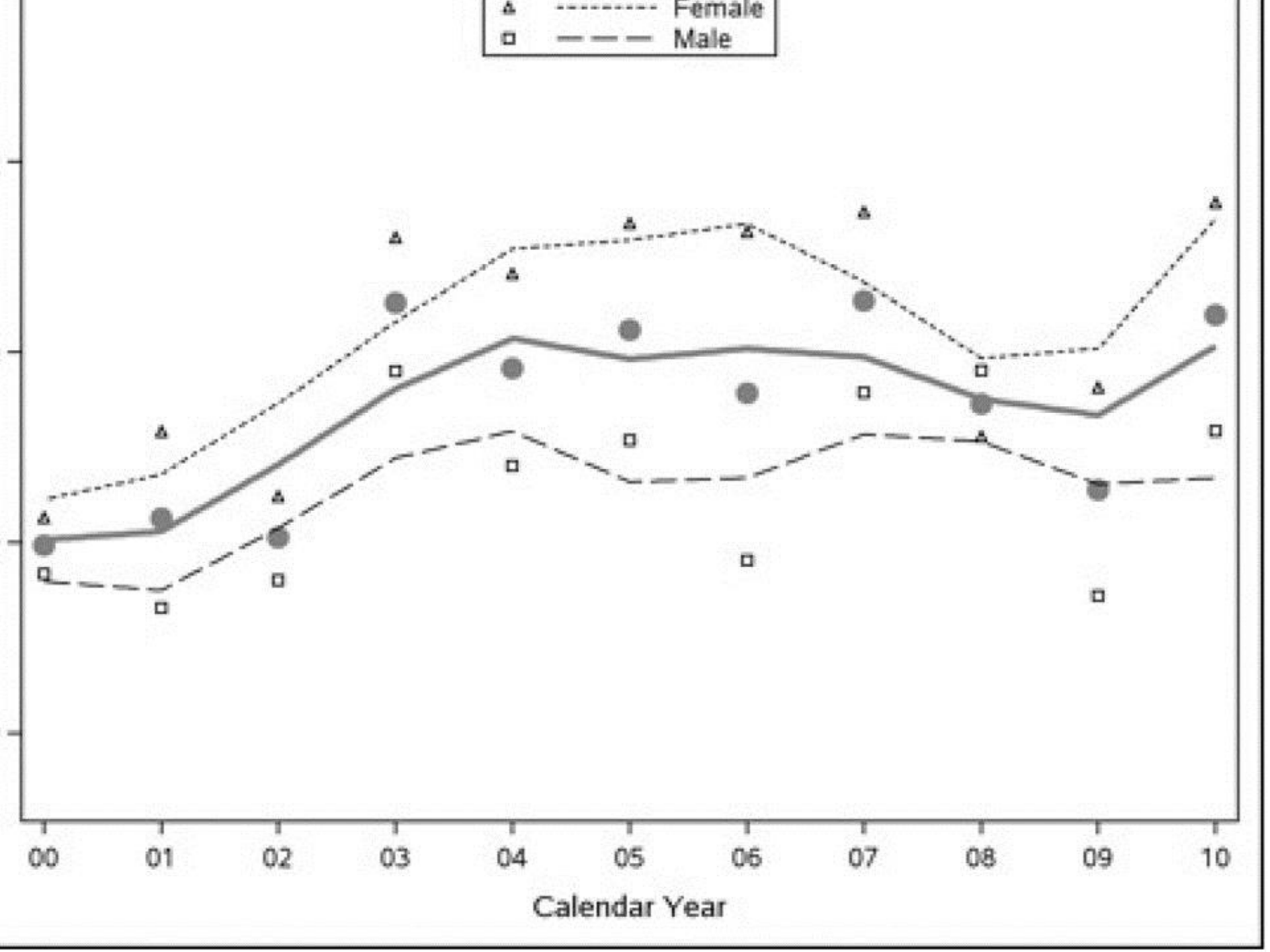
- Diabetes
- Thyroid disease
- Liver disease

Nervous System

- Fibromyalgia

Cancer

- Non-Hodgkin's lymphoma
- Cancer in small intestine


Female
Male
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Calendar Year

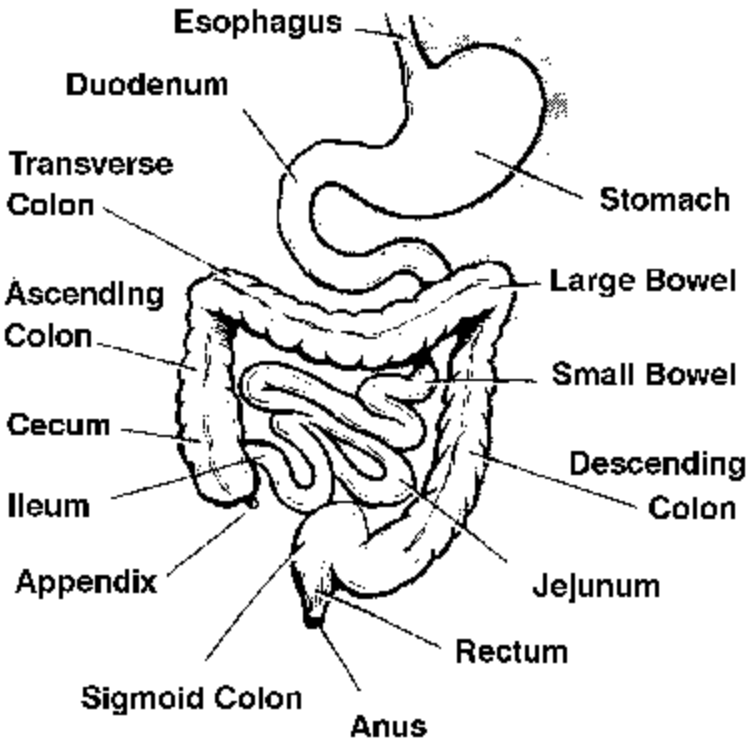
Deficiencies

Most common nutrient deficiencies are:

- Iron
- Calcium
- Folate
- Vitamin D

Absorption

Absorption in small intestine -



Intrinsic Factor

- Although it is made and released in the stomach IF functions in the small intestine
- Ileum – receptor sites for B12 are present
- Absorption for B12 occurs though out the entire ileum

Folate

- Absorption is possible throughout the small intestine but is most efficient in the jejunum
- Absorption from food approximately 50% and higher in supplements
- Enzymes are important in the breakdown to an absorbable form
- 1 ug of food folate = 0.6 ug folic acid from a fortified food or supplement
- Zinc deficiency can impair enzyme activity

Calcium

- Absorption occurs along the length of the small intestine especially the ileum where food remains the longest time
- 30% absorption in adults
- 75% in children
- Estrogen deficiency
- Vitamin D mediated
- 4% is absorbed in the colon
- Increased absorption occurs when there is an increased intake of the mineral

Vitamin D

- Absorbed in association with fat and the aid of bile salts by passive diffusion into the intestinal cell.
- About 50% of dietary Vitamin D is absorbed.
- The most rapid absorption is in the duodenum and largest in the ileum.

Malabsorption of Macronutrients

- Most of the digestive enzymes produced in the small intestine cells are found on the brush border of the villi
- They function to breakdown already partially digested nutrients particularly protein and carbohydrate
- Fat absorption into the ileum segment of the small intestine

Common Symptoms Of CD

- Chronic Constipation / abdominal pain
- Chronic Diarrhea
- Chronic Rash
- Anemia
- Osteoporosis
- Depression
- Headaches
- Tingling in fingers
- Reflux

Case FB

- FB is an 11 year old male with Autism. He is in constant motion. He is non-verbal.
- Height: 57 inches
- Weight 74 lbs.
- Diet: He eats everything. Evaluation shows he does not chew his food and is staff report “bad burps”.
- Chronic constipation that increases behaviors. He is on bowel medications.

What should we try?

- A. Increase his bowel medications – he is on Biscodyl, Senna and Docusate
- B. Change his bowel medication to add Miralax or polyethylene glycol
- C. Gluten Free / casein free diet
- D. Avoid cheese
- E. Alter his food texture from regular

Non-Celiac Gluten Sensitivity

- Diagnosis of CD – blood work – celiac panel with symptoms usually no biopsy, positive for antibodies and no symptoms, biopsy

- What happens when there are no antibodies but the symptoms persist?

Non-Celiac Gluten Sensitivity

- Affects 6-7 times more people than celiac disease

- Dr. Alessio Fasano MD reports there are three main conditions – celiac disease, gluten sensitivity and wheat allergy – are based on very different mechanisms in the immune system.

- Living Without Aug/Sept 2011

Non-Celiac Gluten Sensitivity

- “No conclusive test for it. The only way to determine gluten sensitivity is an exclusion diagnosis – you have a problem with gluten. The problem goes away when you go on a gluten free diet and comes back when you add gluten back into your diet.”

- “If you are gluten sensitive, you will see quick improvement on the diet in a matter of days or weeks unlike months or years with celiac disease.”

Interview: Dr. Alessio Fasano Living Without Aug/Sept 2011


GLUTEN
FREEDOM
ALESSIO FASANO, MD
WITH SUSIE FLAHERTY

- We as professionals, have to rule out all the possibilities:
- Reflux
- Allergies
- Chemical Intolerance to preservatives or coloring additives

Elimination Diet

- Determining what is the trigger? (to the behavior)

Food Allergies

Children with autism are more negatively affected by the symptoms of food allergies, sensitivities and intolerances due to their problems with sensory integration disorder.

Food Allergies

- Allergy – an immunological response to food protein
- IgE antibody mediated immune response
- Active reactions
- Affects skin, respiratory system and or gi tract

Immunologic Response

1st Mechanism

- IgE mediated
- Protein breaks down into peptides
- Peptide crosses the gut wall barrier
- Immune system attacks foreign protein
- Result is a pac man affect to engulf the protein
- Histamine response
- Causes inflammation within 30 minutes

Immunological Response

- 2nd Mechanism

Cell Mediated Response

Involves subacute and chronic reactions

Affects primarily the gi tract

Undigested peptide is released into the blood stream

Takes 2-3 days impact the gi system

Intolerance

- Caused by a defect in metabolism usually deficient enzyme
- Non-immunologic reaction
- Reactions imitate those of an allergy

  ex. - deficiency of lactase enzyme results in milk intolerance

Sensitvity

- A general term applied to a clinically abnormal response to food or a food additive.
- Non-immunologic reaction
- Food additives commonly reported to cause reactions in sensitive individuals include sulfites,aspartame, MSG, BHT, BHA and tartrazine (yellow dye No. 5)

Testing

- Skin prick test or RAST test only detects IGE response

Reactions

- 5% of Food Reactions:

  IgE mediated food allergy

- 95% of Food Reactions:

  Cell mediated food allergy

  Sensitivity

  Intolerance

Detoxification System Impairment

- Neurotoxic chemicals are particularly toxic to the sensitive, rapidly developing systems of the fetus, infants, and young children.
- Lower IQ
- Learning disabilities
- Attention deficits
- Hyperactivity
- Impulsiveness
- Aggressive behavior
- Speech difficulties
- Mental deficiencies

Detoxification System Impairment

Studies indicate that children with autism exhibit atypical detoxification function:

Lead

Arsenic

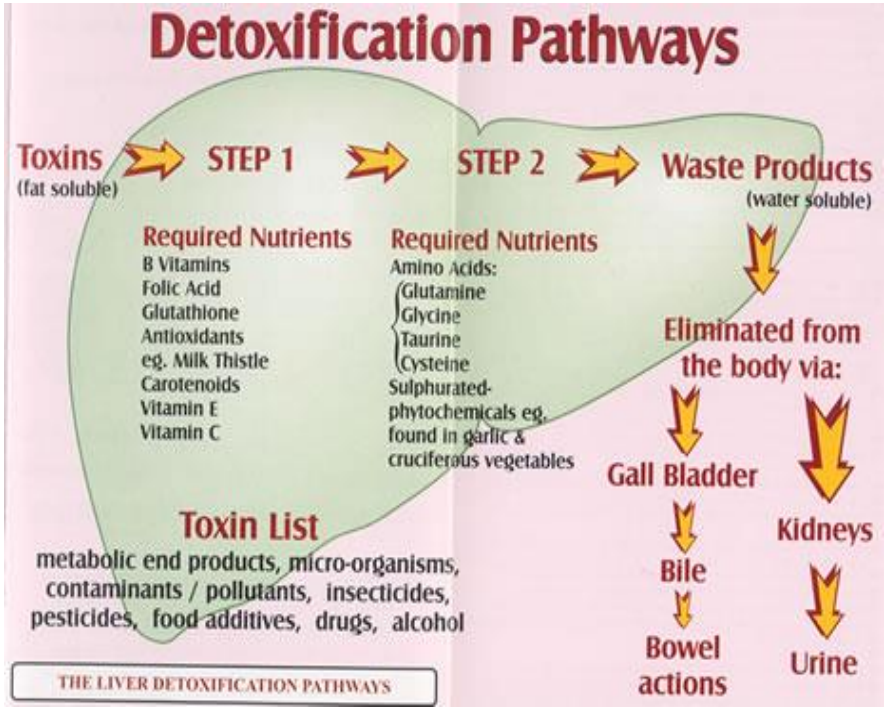
Mercury

Am J Med Genet B Neuropsychiatr Genet 206; 141B:947-956

Am J Clin Nutr. 209;89:425-430

Detoxification System Impairment

- Enzyme deficiency in the sulfation path in the liver
- Eliminate exposure to toxins


Detoxification Pathways
Toxins
(fat soluble)
STEP 1
STEP 2
Waste Products
(water soluble)
Required Nutrients
B Vitamins
Folic Acid
Glutathione
Antioxidants
eg. Milk Thistle
Carotenoids
Vitamin E
Vitamin C
Required Nutrients
Amino Acids:
Glutamine
Glycine
Taurine
Cysteine
Sulphurated-
phytochemicals eg.
found in garlic &
cruciferous vegetables
Eliminated from
the body via:
Gall Bladder
Kidneys
Bile
Bowel
actions
Urine
Toxin List
metabolic end products, micro-organisms,
contaminants / pollutants, insecticides,
pesticides, food additives, drugs, alcohol
THE LIVER DETOXIFICATION PATHWAYS

Detoxification System Impairment

- Basic nutrition suggestions to protect against toxins

Healthy diet

Vitamin Mineral supplement

Treat iron deficiency anemia (increase lead decreases iron level

Reduce exposure to toxins

Safe drinking water

Neurological

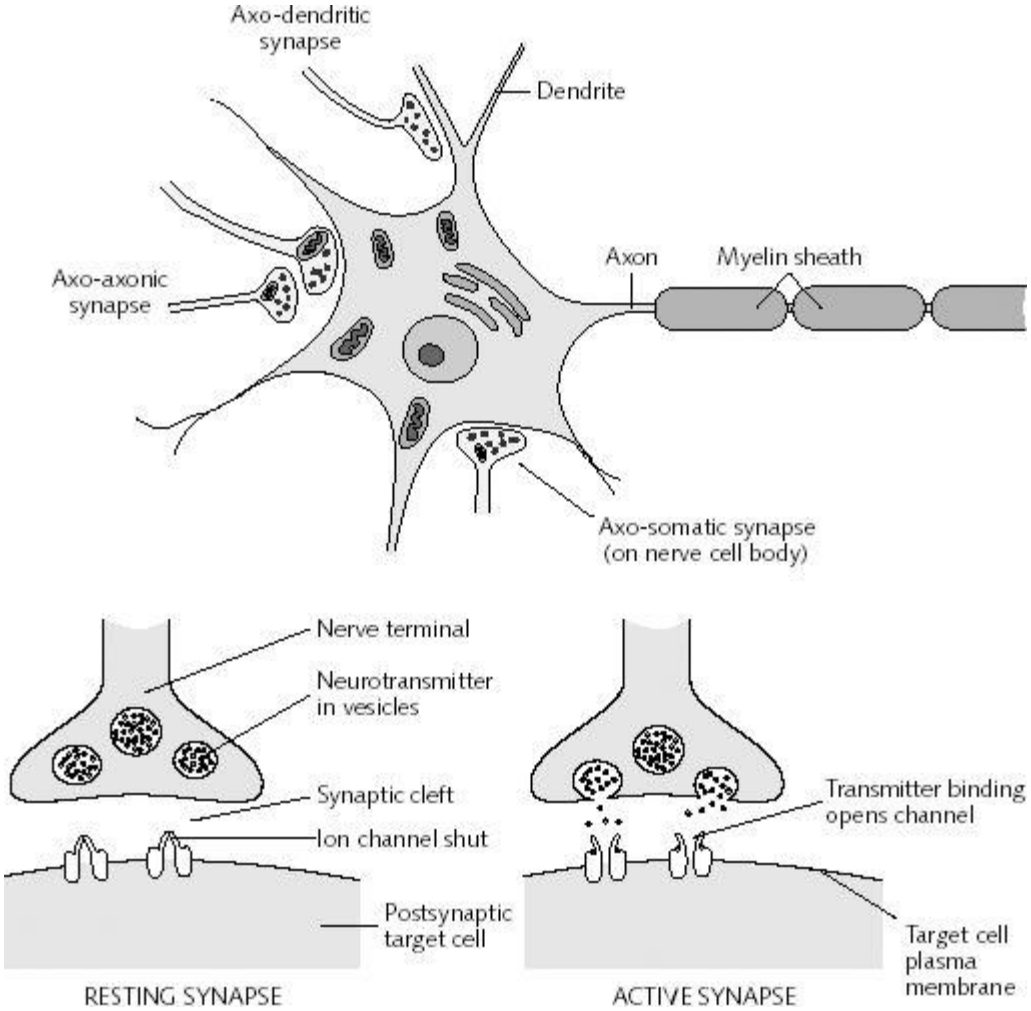
- Individuals with Autism are neurologically compromised.
- Neurotransmitters are chemical messengers in the brain. Behaviors and interaction are governed by these chemicals.

Biol Psych. 2007;61:551-553

Nutrients

- Brain uses amino acids from foods for optimal brain function
- Vitamins and minerals are cofactors to drive neurotransmitters
- Water move in and out
- Omega 3 fatty acid layer the axon

10,000 terminals at the end of every axon and 240 trillion synapses in the brain requiring a lot of chemicals known as neurotransmitters to go across synapses and send the chemical messages to the next axon



Essential Fatty Acids

- Functions of EFA (Omega 3)

Brain development of the fetus, infant and young child

Maintenance of normal brain function throughout life

Vital for brain cell signaling

Prominent structural fatty acid in the gray matter of the brain and retinol tissue

Essential Fatty Acids

- Daily Intakes of Omega 3 Fatty Acids:

  Alpha Linoleic Acid (ALA)

  800-1,100 mg/day (adult)

- EPA + DHA

  650 mg/day (adult)

Sources of EFA

Source plant derived	ALA mg/T
Flaxseed oil	7,300
Flax seeds	2,500
Canola oil	1,500
Soybean oil	900
Olive oil	100
Walnuts (per ounce)	2,500
Wheat germ	900

Essential Fatty Acids

Source marine derived	EPA + DHA mg/oz
Tuna, white canned in water	250
Tuna, light	83
Tuna, fresh	83-400
Sardines	333-500
Herring	500-667
Salmon, farmed Atlantic	400-667
Salmon	222-500
Trout, farmed	333
Trout, wild	286

Essential Fatty Acids

Source	EPA + DHA
Cod liver oil	550 mg. ½ tsp.
Coromega	650 mg. packet
DHA Junior	70 mg/soft gel
Fish Oil Supplements	330 mg. capsule
Omega 3 enriched eggs	150-400 per egg

Nutrition Therapy

- Treat nutritional deficiencies, promote self-healing of biomedical conditions, and maximize the child's brain function to enhance their response to treatment approaches.

Nutrition Interventions

- Basic Daily Supplement

  Multivitamin + minerals

  Essential Fatty Acids (Omega 3)

Vitamin Mineral Supplementation

Indications for use:

- Limited variety of foods eaten
- Mealtime behavior problems
- Elimination diets
- Food allergy/sensitivity/intolerance
- Chronic GI disorders

Vitamin Mineral Supplement

Nutrient Deficiency Stages

Preliminary	→	Depletion of tissue stores
Biochemical	→	Reduced enzyme activity
Physiologic/Behavior	→	Subclinical deficiency symptoms
Clinical	→	Symptoms worsen
Anatomical	→	Specific syndromes

Vitamin & Mineral Supplement

- Subclinical deficiency symptoms:

Irritability

Mood and behavior changes

Poor concentration

Depression

Anxiety

Sleep disturbances

Loss of appetite

Vitamin Mineral Supplement

- OTC Full spectrum multivitamin and minerals
- Fat soluble vitamins
- Vitamin B complex
- Minerals

Other Interventions

- Health care professionals should be prepared to support a parent's decision to try nutritional interventions for their child and assist in safely conducting a trial response with medical supervision.

Feeding Problems

- Picky Eater
- Decreased variety of food
- Foods lost due to burn out
- Able to tolerate new foods on plate, touch or taste
- Eats at least one food from most food textures
- Adds new foods to repertoire in 15-25 steps

- Problem Feeder
- Restricted range of foods <20
- Foods lost to burn out, foods not regained
- “Falls apart” when presented with new foods
- Adds new foods in > 25 steps

Feeding Problems

- Advanced feeding strategies
- Identify and treat medical and GI disorders
- Identify and treat nutritional deficiencies
- Evaluate oral-motor & swallowing skills
- Evaluate sensory integration processes
- Conduct a behavioral functional assessment
- Develop a multi-disciplinary feeding team
- Develop a feeding intervention plan

Medications

- Benicar- non-celiac sprue side effect
- Phenobarbitol – increase Vitamin D and Calcium intake – may need Vit B 12, Folic acid long term use
- Omeprazole (Prilosec) – may decrease iron absorption and possible Vit B12
- Valproic Acid (Depakote) increased Calcium and Vit D intake or supplement

Summary

1st Basic Nutrition

Healthy diet – low in refined and processed foods, low and sugar and nutrient dense to reduce inflammation.

Avoid chemicals that may tax the detoxification system and impose inflammation and impair gut function.

Support with high quality probiotics and essential fatty acids to reduce inflammation and optimize intestinal integrity

Vitamin D supplementation when clinically indicated

MVI / mineral supplement

Individual nutrients

General treatment strategies for feeding problems

Referral to multi-disciplinary feeding team

Questions?