Most recent research (from PubMed)

- Most children with ASD have evidence of oxidative and physiologic stress
  - Measurement of lipid peroxidation can identify this
  - Biopterin can be better marker of stress than cysteine or glutathione
  - BH4 is impaired by stress and can help treat these children
  - BH4 as well as DMSA can help scavenge free radicals

- Increasing glutathione is very important for oxidation defects and our children with ASD. You can raise glutathione levels through:
  - NAC, ALA, Vitamin C, B12, Folinic acid, NADH, Silymarin, Pycnogenol, Ribose
  - Intranasal GSH may be more beneficial than inhaled or nebulized

- Glutamate is involved in most neurotransmitter pathways in the brain
  - It is an excitotoxin and abnormally elevated in children with ASD
  - Glycine (up to 2 gms) can help to counter glutamate

- Melatonin can provide neuroprotection against mercury toxicity, raise serotonin levels as well as help with sleep initiation

- Rice (even some organic forms) have been found to have arsenic; you may consider basmati as most likely less arsenic at present

- Oxytocin now available in oral form and some clinicians find this more beneficial than transdermal

- MTHFR testing may be beneficial diagnostically or prognostically in families
  - C677t associated with increased risk of ASD and CV disease in homozygous form
  - A1298 not significantly associated with increased risk

Consider reading “The Other Brain” by Doug Fields [www.theotherbrainbook.com], “Autism Revolution” by Martha Herbert and “The ADHD and Autism Nutritional and Supplement Handbook” by Dana Laake and Pam Compart

- Autism is “too much noise in the brain” caused by extra garbage not being treated and removed by microglial cells and astrocytes
- Neurons are not the only effected site in the brain
- Glial cells, astrocytes, extracellular matrix, blood vessels and membranes are also important and effected
- Neurons are very dependent on astrocytes
- Astrocytes are the garbage collectors of the brain that help to sequester and clear toxins; astrocyte function can be overwhelmed
  - GSH helps to facilitate astrocyte function
  - Glutamate inhibits this (acting to withdraw astrocyte filopodia)
  - GABA inhibits glutamate and increases neuronal firing
Microglial cells originate in the bone marrow and are the first line of defense of the immune system in the brain; malfunction creates chronic inflammation
  - Provide antigen presentation, secrete proteolytic enzymes and activate proinflammatory cytokines
  - Stem cell transplant of microglia alone in mouse model of Rett Syndrome improved life span, improved locomotor activity
  - Chronic inflammation is a failure of acute inflammation to resolve and an accumulation of toxic mediators exerting toxic effects

ASD and Anxiety
  - Activity of autonomic nervous system altered in ASD
  - Stress (physiologic and oxidative) effects endocrine and autonomic nervous systems
    - Insulin resistance common with symptoms of fatigue, carb craving and central obesity
    - Treat with low glycemic index diet, adaptogenic herbs, pantothenic acid, licorice (on a short term basis) and phosphatidylserine
  - Decrease anxiety through:
    - Essential oils
    - Lowering Cortisol through adaptogens (such as ashwagandha, rhodiola, ginseng, bacopa)
    - May also consider black cumin seed, skullcap and passionflower
    - Magnesium malate decreases glutamate activity and decreases anxiety
    - Chromium, zinc, EFAs, folinic acid, tryptophan, theanine, SHTP, Namenda, phosphatidylserine and salt can also be helpful in decreasing anxiety
    - Pranic breathing (www.heartmath.org)
    - Bacopa can also be helpful in improving attention, cognition and impulse control

Seizures
  - Sign of body dysregulation
  - EMFs increase blood brain barrier permeability and nerve cell damage
  - Modified Atkins diet can be helpful in treating seizures (Epilepsia, 2008)
  - 1014 children with ASD studies (Brain Dev, Nov, 2010)
    - 37% with seizures
    - 86% with epileptiform discharges, most in frontal lobe
  - Supplements for seizures include magnesium, zinc, selenium, B6, folinic acid, taurine, theanine, carnitine, CoQ10, amino acids and B12