

Naturopathic Insights to Help Manage Complicated Cases

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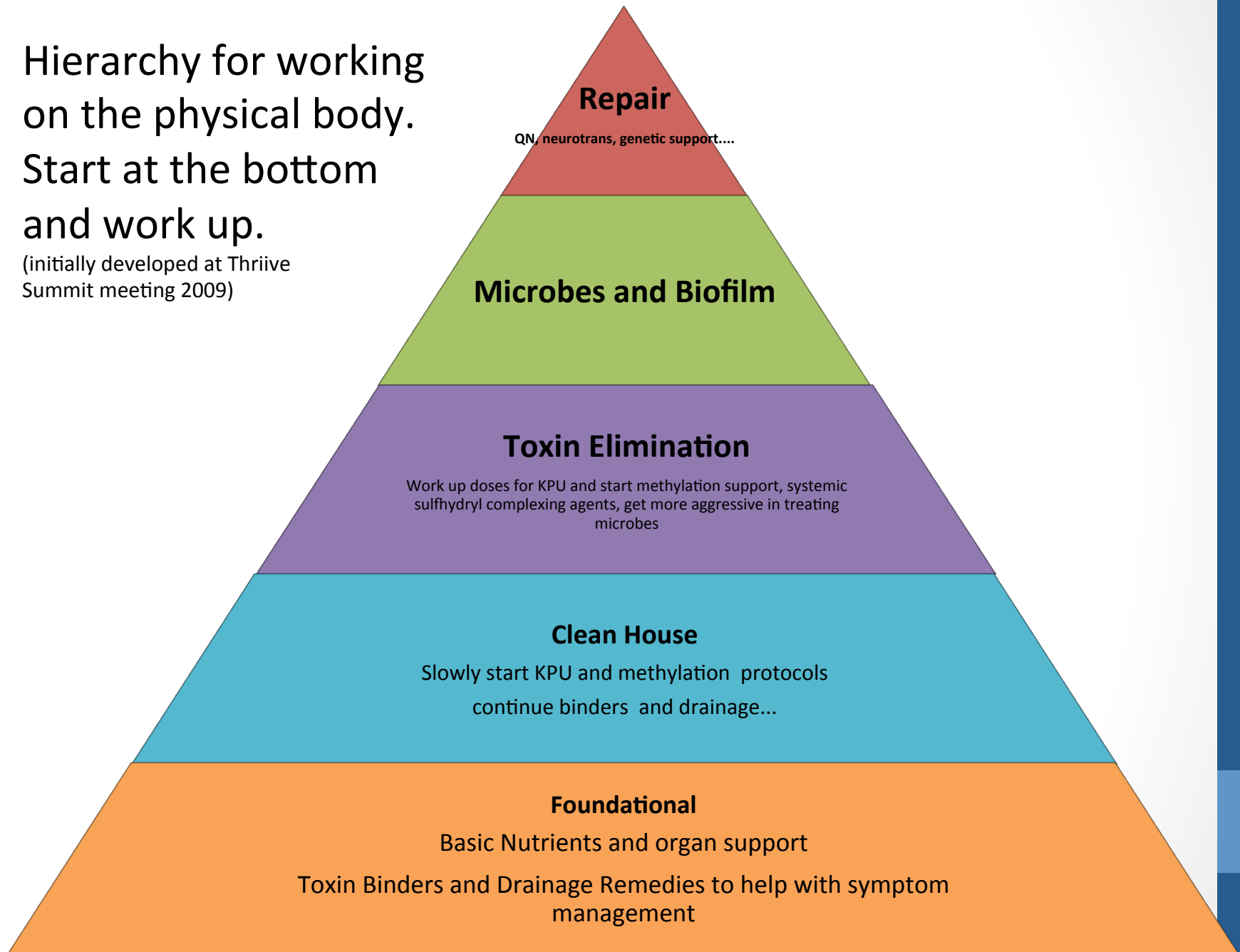
Autism One- May 2016

My background

- BS in Biochemistry 1998
- Doctorate of Naturopathic Medicine, Bastyr University- 2003
- Worked with Dr Klinghardt 2003-2005 and teach for the Klinghardt Academy since then
- Naturopathic physician using both prescription and natural treatments
- Practice focus is autism and adults with chronic illness not well managed with conventional medicine
- I utilize autonomic response testing with all patients to help sort through all of the treatment options and now teach for Dr. Klinghardt's Academy showing others how to do this work (www.klinghardtacademy.com)

Hierarchy for working
on the physical body.
Start at the bottom
and work up.

(initially developed at Thrive
Summit meeting 2009)



Where to start???

- Clean up the diet (SCD, low carb, whole foods)
- Reducing stress levels at home
- Reducing toxic exposures
- Getting a baseline nutritional protocol going- oils high in DHA, vit D, minerals, probiotics
- Make sure there is adequate fluid intake

Support the organs of elimination

- Before doing any anti-microbial or metal treatments, you absolutely have to **support the detox organs**:
 - Kidneys
 - Liver
 - gut
 - skin/lymph
- Never do more killing or metal mobilizing than what the body can eliminate!

Supporting the Kidneys

This organ is an absolute must to support if you are chelating metals!!!

- **Viatrex Ki-Inflam or Ki-UB homeopathic sprays**
- **Unda 243**
- **Electrolytes** added to all fluids
- Tapping on K27 whenever taking supplements
- **Cilantro** rubbed **topically** over the kidneys (metals)
- BioPure The Deo topical over the kidneys
- Ion Cleanse foot baths (AMajorDifference.com)

Electrolyte Recipe

If Using Young Coconut Water:

- 2 cups young coconut water
- 2 cups water (to make one quart liquid)
- $\frac{1}{4}$ teaspoon baking soda (sodium bicarbonate)
- $\frac{1}{4}$ teaspoon sea salt

Liver Support

(Suspect this with sluggish bowels and in general overly sensitive to any treatments)

- **Viatrex Liver homeopathic spray**
- **Ultrathistle** (milk thistle product that is easier to absorb)
- **Castor oil packs** over the liver with heat for up to 50 min daily
- **NAC**
- **Phosphatidyl Choline** (oral or IV)
- **Glutathione** (start slow if they are sensitive)
- **Taurine**
- **Beta Plus or Beta TCP** by Biotics (GB/bile support)
- **Pekana Mundipur**
- **Quicksilver Clear Way Cofactors** (good if GSTT1 absent)
- **Designs for Health Amino D-tox** (phase 2 liver support)

The gut

- **Constipation**- vit C, mag citrate, JLB, aloe, think yeast, castor oil packs, prunes, stop eating dairy
- **Diarrhea**- probiotics, charcoal, bentonite, arsenicum homeopathic, think bacteria/foods
- **Gas/bloating**- bacteria or yeast or foods, enzymes
- Lack of **appetite** or voracious appetite- adrenals, parasites, mitochondrial needs
- **Rashes/eczema**- think foods or yeast
- **Puffy eyes** (aka allergic shiners)- foods or supplement reactions

Digestive Enzymes

- Look at stool tests for evidence of fat malabsorption or undigested food
- Be careful with chewables and the tooth enamel
- My favorites: (really anything with DPPIV)
Kirkman Enzyme Complete DPPIV with isogest
Klaire Vitalzymes Complete
Houston TriEnza
Tyler Similase Lipo
NOW brand gluten digest (has DPPIV and is inexpensive)
- Also consider **HCL**, especially in kids with ongoing fat malabsorption

My favorite toxin binders

keep these ideally 1 hour from meds

- **Chlorella**- bigger doses are more binding. Typically 1000mg or more per 50 lbs body weight
- **Chia seeds**- 1 Tbls soaked in water for 30-60 min daily
- **Acacia Fiber**- has almost no taste or texture
- **Sonne bentonite** liquid- 1 Tbls in large glass of water up to 2x/day
- **Charcoal**- this is the #1 suggestion when people call the office in crisis. If it constipates, chase it 30 min later with magnesium citrate
- **Quicksilver IMD** intestinal metal detox is one of the most effective and best tolerated (see work from Chris Shade)
- **Apple or Citrus Pectin**

BioPure Zeobind (or other zeolite powders)

- Dose is typically 1 tsp up to 3 times daily and sometimes higher
- Dispenses well in liquids with very little taste
- Less constipating than other binders
- Binds toxins and also helps as an anti-microbial by starving out communication for yeast and bacteria
- Very well tolerated in sensitive kids and adults

Herx Support (die off management)

- **Epsom salt baths**- 2 cups in the tub or 1 cup in a leg soak. Good source of magnesium.
- **Baking soda baths** with up to 8 cups
- **Vit C** in frequent doses- with each meal and at bedtime, natural anti-histamine
- **Anti-inflammatories or anti-histamines**
- **Homeopathic drainage**: Pekana detox and drainage kit, Heel Detox Kit, Viatrexx, Unda...

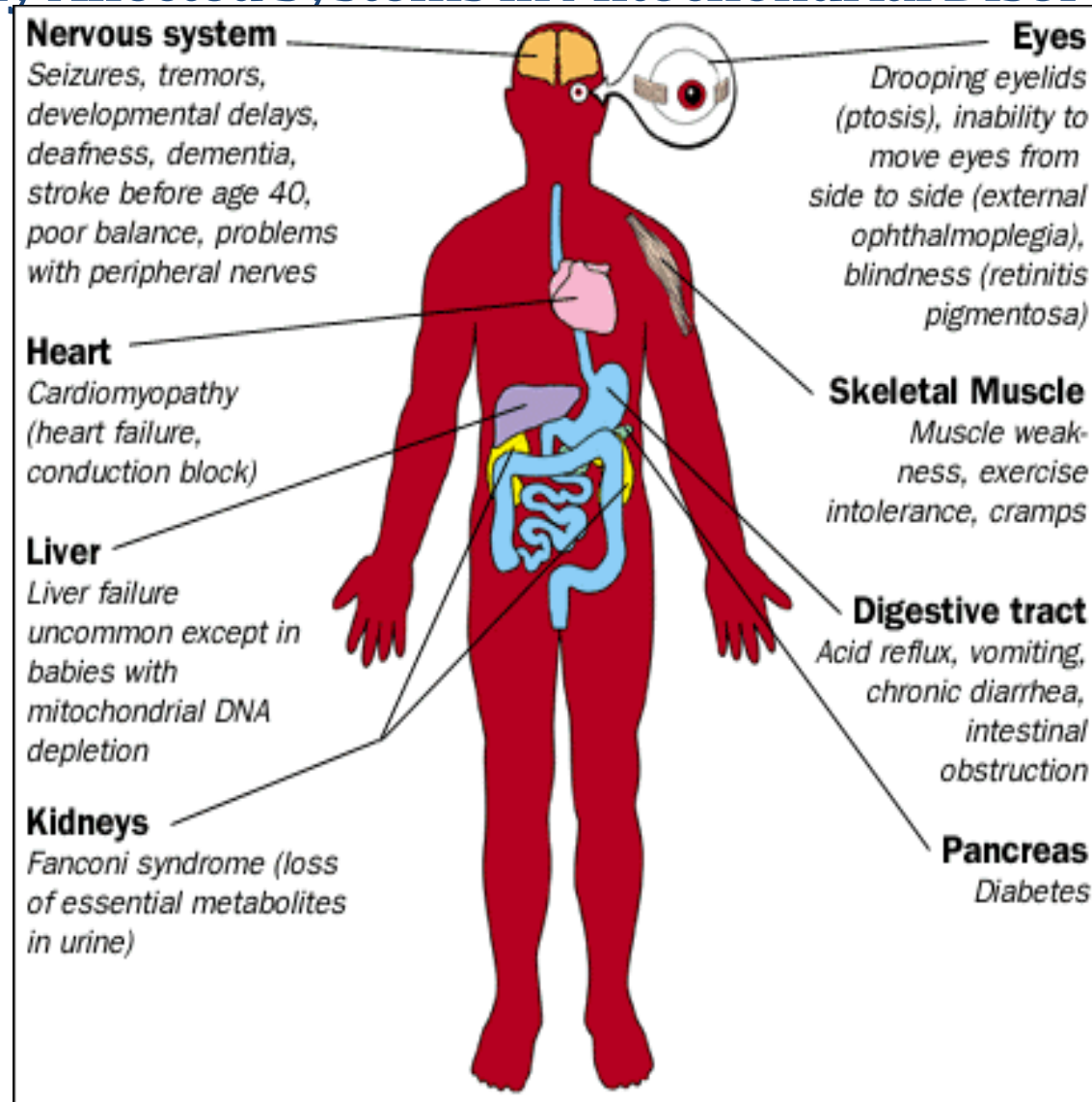
Mitochondrial Roles and Concerns (the gas that runs the car)

- Newest research is showing chronic illness and toxicity can trigger mitochondrial dysfunction
- Can present at any age
- Many patients have dysfunction not at the full level of disease
- Many neuro and psych disorders are associated
- Turn genes on/off
- Process chemicals and xenobiotics
- Build neurotransmitters
- Metabolize neurotransmitters
- Process hormones
- Build immune cells
- DNA and histone synthesis
- Produce energy (ATP)
- Protective coating on nerves
- Build and maintain cell membranes

Clinical signs of needing mitochondrial support

- Fatigue
- Growth delays
- Lacking stamina
- Crashing after adding methylation support (makes them tired)
- More adrenal stress
- Immune dysfunction

Commonly Affected Systems in Mitochondrial Disorders



<http://www.mitoresearch.org/treatmentdisease.html>

Lab indicators of Mito Dysfunction

- Low B12 and RBC folate
- Low BUN/CRT
- Low reduced glutathione
- Low cysteine
- Isolated elevation of AST or ALT
- Low glucose
- Labcorp or Quest done fasting or OAT shows increased lactic acid
- Pyruvate being high
- Succinate being very low
- Carnitine free and total (levels will be low)
- Creatine kinase high
- Ammonia high
- Blood CoQ10 low

Mitochondrial treatments

(per MAPS suggestions)

- **CoQ10** 5-10-15mg/kg/day or more
- **Carnitine** 50-100mg/kg...up to 5000mg daily (note: high doses can cause a fishy smell)- prescription Carnitor is typically the best. Acetyl l-carnitine as a supplement has more effect on the nervous system
- **Exercise- this is the only thing that increases the number of mitochondria!!!**
- Folinic or 5-MTHF 1-10mg/day
- Creatine monohydrate 5-10g/day
- B12,selenium, succinate, ginkgo
- D ribose 0.5-1gm/kg
- Glutathione
- Antioxidants
- B vitamins- esp thiamine and riboflavin
- Milk free diet
- **Nice combination products:**
 - Researched Nutritionals ATP Fuel- MAKE SURE TO USE FULL DOSE
 - Allergy Research NT Factor Lipids
 - Mito Spectra packets- us at full dose!!!

Mitochondrial Dysfunction

- Newer article first to be accepted of this concept of mitochondrial dysfunction vs. disease which lays out an algorithm of how to work up mitochondrial concerns and what labs to run and triggers to rule out

Mitochondrial Dysfunction and Autism Spectrum Disorders: A Simplified Approach. Autism Science Digest, Rossignol and Frye, 2011.

Natural anti-inflammatories

- **Quercetin with Bromelain**- like Thorne Quercenase
- Biogenesis **Bio-Inflammatory Plus** (nice combination)
- **Curcumin**- BioPure Curcusyn, Thorne Meriva-SR, Curapro, Xymogen Curcuplex CR or Enhansa...
- **Omega 3's**- especially cod liver, fish or salmon oil (doses of 3-4 gm or more)
- **YES parent essential oil** caps and liquid (pumpkin, EPO, safflower, sunflower, flax and coconut oils)
www.yes-supplements.com
- Algonot **NeuroProtek** (Dr. Theoharides)
- Pekana **Inflamyar** or **Viatrexx Infla** homeopathics

Natural anti-inflammatories

- **Melatonin**

- high doses are found to be neuroprotective
- Protective against damage from methyl mercury
- Clinically shown to calm many neurological symptoms
- Look for liposomal products like Oncotonin or DaVinci liposomal melatonin spray
- Doses may go up to 30mg each night

Neuroprotection by Melatonin on Mercury Induced Toxicity in Rat Brain. *Pharmacology and Pharmacy*, 2011, 2, 375-385.

Natural anti-inflammatories

- **Address gut inflammation**

- stool labs can show inflammatory indicators or Urine OAT shows elevated quinolinic acid
(Great Plains, Genova, Metamatrix, Diagnostechs)
- Brain inflammation and excessive excitatory neurotransmitters often are triggered by the digestive tract
- Never forget to address the gut!

Gastrointestinal Immune System and Brain Dialogue Implicated in Neuroinflammatory and Neurodegenerative Diseases. *Curr Mol. Med.* 2011 Nov;11(8) 696-707.

Most helpful labs

- Basic labs: CBC with diff, chem panel, homocysteine, vit D, ferritin, thyroid, RBC zinc and magnesium
- Stool testing
- Urine organic acid testing (OAT)
- Metal testing (provoked urine)

What you can learn from a CBC

- high WBC's- points toward an acute response or inflammation
- Low WBC's chronic point toward KPU concerns (upper 2's, low 3's)- think needs for zinc and B6
- Eosinophils- elevation points to allergies and/or parasites
- Monocytes- elevation points to chronic immune activation and possibly parasites
- Lymphocytes- elevation points toward viral infections
- Neutrophils- elevation points toward bacterial concerns
- MCV (size of RBC's)- if they are large in size then you suspect low B12 or folate. If they are small in size you suspect low iron and/or copper.

What you can learn from a chem panel:

- Low alkaline phos under 50- big sign of zinc deficiency
- ALT and AST show signs of liver stress (is your child tolerating meds ok?)
- Albumin and protein are good indicators of protein absorption (especially if low, thinking malabsorption)
- Low normal CRT is common in kids on the spectrum- could be an indicator of mitochondrial needs or concerns with how well they can clear metals/chemicals

What you learn from an OAT test:

- B vitamin and folate needs
- Glutathione status
- Bacterial/yeast/clostridia overgrowth
- Neurotransmitter balance (dopamine, serotonin)
- Quinolinic acid elevation is a marker of brain inflammation
- Mitochondrial needs
- Oxalate concerns
- Ammonia concerns (orotic acid)

What you learn from a stool test:

- Fat absorption/malabsorption
- Digestion of proteins and foods
- Bacterial balance
- Butyrate levels
- Propensity toward strep overgrowth
- Amounts of probiotics thriving or not
- Markers of inflammation
- Yeast growth
- If abnormal bacteria or yeast are found, sensitivity testing is done to see what treatments could be effective
- Parasites are screened for, but are difficult to find

For parasites:

- Metematrix uses a DNA probe in GI Effects test
- Diagnostechs uses IgA responses to identify parasites the immune system is responding to

Microbes

- Clostridia
- Strep
- Lyme and co-infections
- Parasites
- Yeast
- Viruses

Clostridia and abnormal bacteria

- With **bacterial overgrowth** you tend to see **AGGRESSION!** (biting, hitting, head banging)
- Stool tests show low growth of good bacteria and high levels of all kinds of bacteria that should not be there
- Markers on the OAT show high HPHA
- Note that the **clostridia that makes kids seem crazy is not always C. diff** (may be other species)
- Clostridia is known to interfere with dopamine metabolism and can result in elevated VMA levels on OAT testing (or can interfere with COMT pathway)

Treating Clostridia

- BioImmersion **Supernatant**- 2 daily
 - probiotic specifically proven to kill resistant strains of Clostridia resistant to antibiotics
- High doses of **bifidus**
- **Culturelle**
- **Saccharomyces** (sometimes)
- Often **Flagyl** or **Vancomycin** would be needed if aggression is very bad (**immediate calming effect**)- New dosing protocol found to be more effective:
 - * 10 days 3 X daily, followed with 3 x daily dosing every 3 days for another 30 days

Clinical signs of parasites

- Rashes on the chest or neck
- Discoloration around the mouth
- Males often have risky behaviors
- Aggravations around the full moon (bloating, irritation, etc)
- Pimples on the head within the hair

Labs:

- stool test from Metametrix uses a DNA probe for better sensitivity
- Diagnostechs offers a nice test that includes a saliva test for IgA reactions to many of the different parasites and even some of the major food groups
- Generally, labs are deceiving
- Look at CBC for elevated eosinophils

My favorites for treating parasites

(the most difficult to lab test, but the first thing to treat)

- **Alinia** (dose varies)- 3 day protocol repeated in 2-3 weeks. Up to a 20 day protocol for Lyme/Babesia at 1000mg BID (max)
- We are seeing more and more needing to do a longer continuous protocol lasting several weeks: **Biltricide, Ivermectin/Pyrantel, Albenza, Alinia, Mebendazole, Tinidazole, paromomycin**
- It seems to be very effective to **follow prescription parasite medications with homeopathic support**

My favorites for treating parasites

(the most difficult to lab test, but the first thing to treat)

- **Mimosa Pudica** (from BioPure or Hopkinton drug)- herb that also has liver protective effects- 1 tsp daily or 2 capsules twice daily at least 2 days a week
- **PCHF Botanifuge**- 2 caps twice daily for several months
- **Kauai Herbals Papaya Black Seed blend**- pulsed around the full and new moon
- **Vermox/Mebendazole** (100mg BID up to 20 days- sometimes we are doing this for up to 5 days twice a month around the full and new moon
- **Biltricide** (600mg TID for one day then repeat in 2-3 weeks)

Clinical signs of yeast/fungus

- Gas and bloating
- Lower abdomen is resistant to weight loss
- Kids- high pitched squealing, silly , flushed cheeks and stimming
- White coating on the tongue
- Brain fog and fatigue
- Vaginal or anal irritation/itching/redness
- Headaches
- Weakness/ fatigue
- Sugar cravings
- Stinky BM's
- Light sensitivity
- Rashes
- Memory loss or concentration difficulties
- Joint pain and morning stiffness
- Shortness of breath
- Sinus congestion
- Numbness and tingling
- Skin sensitivity
- Muscle aches and pains

Natural Treatments for Fungal Issues

- **Biotin**- used to repair the carboxylase enzyme damaged by oxalates. Important with kids with unresolving yeast issues.
- **Low oxalate diet** and **low carb** and sugar diet
- **Neem**- this has been very well tolerated, especially when there are also sinus issues
- **Probiotics** (like Klaire Therbiotic Complete or Detox Support, VSL#3, Custom Probiotics or BioImmersion Beta Glucan probiotic to stimulate gut immunity)
- **Saccharomyces** – sometimes doses up to 9 daily for tough cases

Natural Treatments for Fungal Issues

- **Uva Ursi**- many stool tests are showing this to be effective
- **Biocidin**- this has been very effective and the drops are not bad tasting
- **Caprylic acid or undecylinic acid**

Prescriptions for fungal concerns

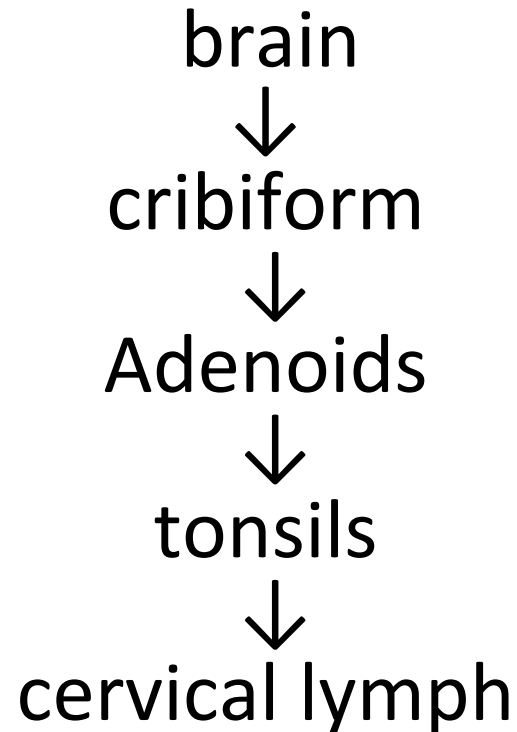
- **Fluconazole**- well tolerated. 100mg daily for kids or 200mg daily for adults. After 2 weeks you can reduce to every 3 days.
- **Nystatin**- this is one of the safest since it is not metabolized by the liver. Dose goes as high as 3 pills 3 times daily of the 500,000 unit tablets. I prefer this to be compounded.
- **Ketoconazole**- use with caution now due to recent warnings for liver toxicity
- **Oral amphotericin B** is being compounded and well tolerated since it is not absorbed systemically.
- **Sporanox** is helpful especially for *Aspergillus* concerns

Tonsils/Biotoxins

- Chronically infected **tonsils** are often a major contributing problem in brain inflammation/autism/autoimmunity
- Degenerated tonsils often house multiple bacterial and viral colonies and produce potent brain neurotoxins
- Strep related brain autoimmunity symptoms in autism: verbal stims, repetitive, ritualistic, obsessive-compulsive (PANDAS)
- Be prepared that currently ENT doctors often do not believe that tonsil infections are problematic - and resist performing a tonsillectomy

The Tonsils

Congestion in this area due to chronic infection is common and leads to back-up of lymph flow and detox out of the brain



PANDAS

Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcus

- verbal stims, repetitive, ritualistic, obsessive-compulsive behaviors
- Severe regression after exposure to strep, even if no URI symptoms appear
- Lab markers can be deceiving
- You have to treat for at least 6 months to give the immune reactions to down-regulate
- Some antibiotics being used are once a week or more **Zithromax** or daily **Augmentin** (do all you can to protect the bowel flora)

PANDAS

- Natural treatments that are most effective:
 - **Biocidin**- may need 10 drops twice daily
 - **Berberines**
 - **Homeopathic 1M Strep dosed up to daily (Boiron)**
 - **LDA/LDI for Strep, foods and inhalants**

Find out where the Strep is...

- Doing rapid strep tests (group A strep) is crucial to identify where the trigger is coming from
- Kids are most reactive to the particular strain they are around the most
- If you find it on the teeth, a simple treatment is **Chlorhexidine mouth rinse 0.12%**

Swish for 30 seconds then spit 5mL twice daily. Do not rinse mouth or eat for 30 minutes after dosing.

- For kids who continue to flare:
 - **Swab the throat AND THE TEETH**
 - Swab the parents
 - Consider rectal or nasal swabs
 - Swab siblings or caregivers
 - Swab the pets

Modulating the immune system

- **Immusist Natural** (www.immusist.com) helps to enhance absorption, anti-viral, seems to correct many imbalances
- **LactORN by BioImmersion-** dosed at 1 level tsp twice a week to modulate macrophage activity and gut balance
- **Low dose naltrexone-** doses from 1mg-4.5mg each night (www.lowdosenaltrexone.org)
- **LDA and LDI** for foods, inhalants, Strep, bacteriodes, Lyme mix, yeast..... (see training via the American Academy of Environmental Medicine or Dr Ty Vincent)

Immusist Natural (www.immusist.com)

- Many of the kids I work with went on it on their own and we have seen:
 - better reports at school
 - less aggravation with winter illnesses
 - overall cognitive improvements
 - other meds start being needed in lower doses
- It is thought to cross the BBB and clinically appears to do so
- Goal with this is to repair the immune system to take care of itself
- **Adult dosing:** work up to 16 drops TID
- **Child dosing:** work up to 8 drops TID
- **Sensitive** people or very sick: 1-2 drops many times a day

BioImmersion LactORN

- ORNs help our immune system to be more alert to possible invasion by viral or bacterial pathogens, but they also help protect our immune system from overreacting. They help in the restoration of an immune system compromised by stress.
- Dose is 1 tsp directly in the mouth twice a week
- We think of this with kids who always get viruses or who get stuck in viral activation on labs and also those with overly reactive gut immune barriers

My favorite natural Lyme treatments

- **LDI for Lyme mix** (See Dr Ty Vincent and AAEM)
- **Researched Nutritional BLT and Microbinate**
- **Samento (Cat's Claw)**- doses up to 15 drops twice daily, working up slow and backing off if a herx occurs
- **Artemesinin**- pulsed for Babesia and parasites- 100-200mg 5 days a week
- Nutramedix **Cumanda**- particularly good if there are joint issues. Up to 30 drops daily, well tolerated.
- **Beyond Balance Bb-1, Bab-1, Bar-1, Clarity K and Clarity K detox**- classic doses up to 8 drops twice daily typically. Well tolerated and glycerite based

My favorite natural Lyme treatments

- **Nutramedix Enula-** Adults needing up to 30 drops BID for 3-4 months (Babesia)
- **BioPure Idalia suppositories**
- **Rectal ozone or UVBI with ozone**
- Researched Nutritional **Transfer Factor LymPlus or Transfer Factor PlasMyc-** 1-2 daily
- BioPure **Quintessence-** This is a mix of Stephen Buhner's top 5 herbs and has a very nice synergy and tolerance- for kids I do up to 2 dropperfuls twice daily

Clinical signs of viruses

- Hot and soft tissue in the forehead repeatedly
- Tinnitus and noise sensitivity
- Fatigue
- Elevated WBC's when symptoms get worse or chronically very low WBC's (in the 2's)
- Enlarged lymph nodes
- Cold sores or canker sores

Treating Viruses

- **Vitamin A** – my standard immune booster at season changes in the Fall (instead of a flu shot) are 100,000IU daily for 7 days (Biotics Bio Ae-mulsion Forte drops or Klaire Labs mycelized vit A liquid)
- **Vit D**- up to 10,000IU daily or more (lab goal 80-100)
- **Monolaurin** or **Lauricidin** (especially if ASD symptoms become worse after a cold or flu)
- **Olive leaf** (I prefer a tincture mixed with **Gingko**)
- **LDM-100** (rash often occurs around day 7-9)
- **Immusist Natural**- up to 8 drops 3 times daily

Treating Viruses

- **Astragalus**- great in acute exposures
- Combinations like Vital Kids **Berry Well Immune** (mild taste)
- Researched Nutritional **Transfer Factor Multi-Immune**
- **Elderberry**
- **Prescriptions: Valtrex, Famcyclovir**

Immune support

- **Selenium**- 200mcg daily during cold/flu season and go up during acute infection
- **echinacea and thymus** glandulars (like NF thymactiv) at first signs of infection
- **Biocidin**- 5 drops twice daily to 3 times daily at first signs of infection (be more aggressive with Strep)
- **Propolis diffuser** (www.beehealthyfarms.com) or **Young living Purification or Theives oil** in a diffuser

Rule out Mold Exposures

- Go to www.survivingmold.com to learn more about Ritchie Shoemaker's protocols and testing
- Suspect with patients that have “yeast” issues within days of discontinuing anti-fungals
- There can be an allergy or immune/inflammatory reaction
- Patients that are agitated when it rains or after going to the library or church
- Often allergic shiners and multiple small lymph nodes all the time in neck
- Snoring/sinus issues/generally very sensitive to odors and foods
- Big link I see with CFS or those who are overly sensitive in general

Mold Sensitivity Approaches

- **stabilize mast cells** (look up Dr. Theoharides)- quercetin, hydroxyzine, ketotifen, benedryl, vit C
- **bind up neurotoxins**- high doses of EPA and DHA, charcoal, Cholestyramine, bentonite, liposomal glutathione
- **LDA for inhalants**
- Do an **ERMI** to check the home!

Anxiety/Stimming!

- Address the gut (clostridia, bacteria, parasites)
- Lithium orotate in doses up to 60mg (see research from Dr Wright at www.tahomaclinic.com) - one of our favorites!
- Zeobind/Zeolite powder dosed consistently 2-3 times daily
- Melatonin in high doses as a liposomal
- GABA (liposomal works faster)
- Theanine can be dosed often
- Make sure you are supporting proper drainage overall
- Viatrexx Neuro 3 is helpful

A few findings with methylation concerns

Lab markers of B12 deficiency

- Elevated serum MMA (methylmalonic acid)
- Elevated plasma homocysteine (normal 6-7)
- Macrocytosis or macrocytic anemia (MCV over 98)
- Elevated neutrophil hypersegmentation (seen on CBC and hypersegmentation run at Meridian Valley)
- Good article on folic acid and neutrophil hypersegmentation

<http://tahomaclinicblog.com/folic-acid/>

Methyl B12

- Injections of this subcutaneous every 2-3 days has been amazing for many kids even in the absence of abnormal labs
- I have seen language and focus gains consistently
- Watch for a big dump of metals
- Kids often are stimulated with the first 2 injections and then this typically calms down
- If it doesn't, or if it aggravates them, switch to hydroxy B12
- See www.drneubrand.com for more info

Hydroxy B12

- We are finding this to be the best tolerated form of B12 once you push 5-MTHF doses (likely because it reduces NO which can be elevated in chronic illnesses)
- Injectable forms:
 - compounded in a 10mg/mL strength preservative free
 - often giving 5mg in conjunction with 5-MTHF shots
- Oral forms:
 - **Perque Activated B12 Guard**- 2mg per tab
 - You can also have this compounded

Basic methylation labs

- **MTHFR gene testing** – see next slide
- **Health Diagnostics Lab offers a full methylation panel** test (looking at folates, glutathione, NO, SAM, SAH)- very useful to see how genes are expressing
- CBC shows **chronic elevated MCV** not responsive to B12 (or someone who tends to have red urine after a B12 shot)
- **Doctors Data Methylation Panel and Oxidative Stress Panel**
- **Methylmalonic acid** as best measure of B12 (elevation indicates deficiency)

Basic methylation labs

- **RBC and serum folate** levels (not that helpful, since not differentiating folic from folates)
- **Serum B12**- rarely low, but if it is the patient is in serious need
- Meridian Valley lab **neutrophil hypersegmentation %** -the lower the better. Higher percentages indicate there are more 5 lobed immature neutrophils in the blood that don't seem to have enough folate to mature properly. (good article by Dr Jonathan Wright June 2010 Nutrition and Healing)
- **Do NOT worry about high B12 or folate in the serum** (this may just be reflective of poor transport into the cell)- think pancreatic insufficiency, lack of intrinsic factor, bacterial intestinal overgrowth
- **CSF folate levels** are also being done in some autistic children

MTHFR testing options...

- Often not covered by insurance unless documented elevated homocysteine
- SpectraCell Labs offers a \$35 copay
- Any Lab Now offers a cheek swab
- 23andme includes this along with an array of other detox genes
- Doctors Data offers a nice DNA Methylation Pathway test
- Amy Yasko offers a Nutrigenomic profile that comes with a long interpretive report

Getting your methylation info from 23andme.com

- www.23andme.com

Go here first and order your kit. Kits are \$99 and since it is ordered directly from the lab

- www.mthfrsupport.com

This tool will allow you to upload your 23andMe raw data and create an easy to read report for use in identifying single nucleotide polymorphisms (SNPs) that may impact your health for \$20

- www.geneticgenie.org

This is another database in which you upload your 23andme raw data and it gives you useful reports in regards to methylation and detox. The charge for this is an optional donation through the site.

www.livewello.com is another option, amongst others

www.knowyourgenetics.com is access to Amy Yasko's report on the 23andme data

Rescue for Over-methylating

Symptoms: headache, aggression, anxiety, feeling terrible if taking too much L-5-MTHF or mB12

Rescue for over-methylating:

- **Niacin**- 50mg up to every 30 min until reactions stop
- **Potassium** (I am finding it has to be a potassium pill 100mg 2-3 times daily and not just what is in electrolytes)
- **Hydroxy B12** can also help by reducing NO

COMT concerns/high dopamine:

- primarily responsible for breaking down the neurotransmitters dopamine, epinephrine, and norepinephrine
- Watch that yeast and clostridia both contribute to dopamine elevation
- This pathway is very sensitive to cortisol and stress
- Use caution in these patients with quercetin (can slow the pathway)
- **Symptoms when this gene pathway is compromised:**
 - **depression, ADHD, anxiety, stimming**

COMT support

- **COMT support:**
 - - Molybdenum as needed
 - - **Magnesium (glycinate or malate)**
 - - **lithium orotate**
 - - B6
 - - Vit C
 - - Niacin
 - - **SAMe**
 - - Adrenal Adaptogens like ashwaganda, holy basil, rhodiola
 - - Watch phenylalanine and tyrosine
 - - MSM, NAC or sulfur containing foods (if tolerated)
 - - Blood sugar stabilization (diet, sleep, exercise, chromium)

CBS concerns

- Acts as a gate-keeper between homocysteine and the rest of the trans-sulfuration pathway
- Some genes result in up-regulation and some in down-regulation

Either mistakes get made when the body is trying to make glutathione and you get excess taurine in the urine, or it slows and acts like a clog in the methylation drain (resulting in sulfur and ammonia and inflammation back-up)

- A good way to track is **watch homocysteine** levels (ideal 6-7) or monitor behaviors when you push methyl donors
- **Watch for sulfur and ammonia concerns**
- **These are your more sensitive patients**, especially if there is also a BHMT concern

CBS symptoms

If the CBS pathway is not working properly the result is:

- Brain fog
- hypersensitive to any sort of detox
- Pain
- can't tolerate sulfur donors for more than a few days
- Chemical sensitivity

Treating elevated homocysteine (and hence supporting CBS)

- phosphatidyl choline 1000mg up to 3 times daily
- NAC- 900 mg twice daily (I prefer as PharmaNAC)
- Glycine- up to 4000mg daily (especially if they have chemical or pesticide exposures)
- B2- 100mg or 200mg
- B6- up to 200mg, starting with 50mg of P5P
- B1- 100mg
- Creatine- up to 1 tsp of powder
- Make sure they have adequate zinc and iron

Other CBS support to consider

- molybdenum
- manganese
- zinc
- EDTA
- slippery elm
- BH4
- CoQ10
- NADH ribose
- SAM
- mB12
- methyl folate

Elevated ammonia

- Labs: orotic acid high on OAT test, ammonia elevated in urine or blood (has to be immediately frozen and not very stable)
- Symptoms:
 - brain fog
 - memory loss
 - poor focus (ADD symptoms)
- Treatments:
 - reduce high ammonia foods in the diet (meat)
 - yucca root 2-3 times daily
 - charcoal 1-2 times daily
 - slow down on methyl-donors
 - BH4

BHMT and DMG

- **when to use TMG vs. DMG-** DMG is the result of TMG getting utilized in this pathway. I typically find DMG (the end product) more helpful if someone has issues with all 3 BHMT genes (02,04, 08). You can always do a trial with each and see. If it is going to work, it will work pretty quickly and have a clear response.
- **ADHD can worsen if this route is overworked....why?** I think this is due to ammonia build up and possibly more SAM going back to SAH (more inflammatory). DMG in these cases can be extremely calming. One of the newer treatment protocols using this (credit to Dr Bob Sears for introducing me to this) is:
- **DMG treatment option:**
http://www.millnut.com/DMG-Liquid-by-Millennium-Nutritionals_p_19.html Each mL is 300mg. Start with 1 mL twice daily and work up to 5mL twice daily.
- * make sure they have sufficient B12 before doing the DMG

MAO-A

- This gene is involved in breaking down serotonin, NE and dopamine. When this is in combination with COMT +/- one may be more prone to develop Obsessive Compulsive Disorder (OCD), mood swings, aggressive and/or violent behavior, and personality disorders. Tryptophan stores can get depleted and urine tests may show high levels of 5HIAA (5-hydroxy indole acetic acid). Focus is to balance serotonin and neurotransmitters.
- Someone with MAO-A concerns in general seems to show more aggression and mood swings
- Treatments to consider: **5HTP, BH4, address ammonia if elevated (charcoal, yucca root)**
- **Focus on balancing serotonin and neurotransmitters**

Remember...

- Kids are recovering every day
- You can never do everything, but each thing you do will make a difference!
- Control what you can and go one step at a time...



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