

Overview of the Biomedical Approach to Autism Spectrum Disorder

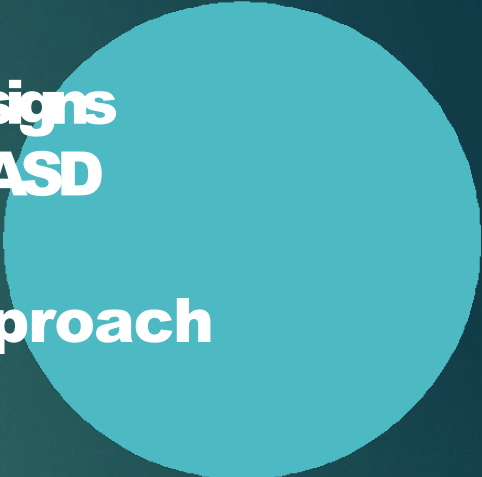
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Goals of the presentation



- ▶ **Audience will learn how to Identify the signs and symptoms of treatable issues within ASD**
 - ▶ **To Illustrate how critical a biomedical approach is for an individual with ASD**
 - ▶ **Understand how biomedical approach can help your child**
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Objectives



- ▶ **Introduce the concept of the vicious cycles in ASD**
- ▶ **Identify what signs and symptoms occur with the many medical conditions in ASD**
- ▶ **Offer treatment options as they relate to the presented medical conditions**
- ▶ **Outline the biomedical approach to ASD, so you better understand how this approach can help solve complex medical conditions**



Finding and Treating the Problems in ASD

DISEASE: SIGNS AND SYMPTOMS

INTRODUCING BIOMEDICINE

PARADIGM SHIFT IN TREATMENT APPROACH

VICIOUS CYCLES IN ASD


Signs and Symptoms of Disease



- ▶ **Disease** – a disorder of structure and function, that produces specific signs or symptoms that affects a location, and is not **SIMPLY** a direct result of physical injury.
- ▶ **Sign** – an observable physical finding so frequently associated with a given condition as to be considered indicative of its presence—like BP reading for Hypertension.
- ▶ **Symptom** – indicates the existence of something, a physical or mental feature which indicates a condition of disease—like headache or abdominal pain.

Traditional Medical Approach



- ▶ **Starts with labels... leading to codes**
 - ▶ **'Manages' the symptoms... not the disease**
 - ▶ **Biomedicine ... attempts to get to the source**
 - ▶ **Doctor as "gatekeeper"... tests and referrals**
 - ▶ **Evidence based medicine... ABA and/or prescription drugs**
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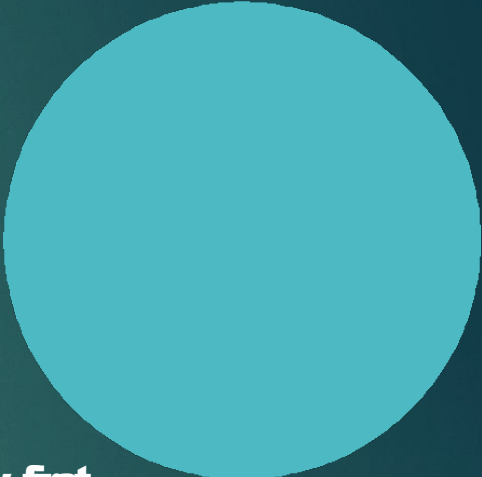
Biomedical Approach

- ▶ **Biochemical individuality**
- ▶ **Genetic predisposition**
- ▶ **Environmental stressors**
- ▶ **Patient centered individual approach**
- ▶ **Identify biochemical and physiological imbalances that can lead to medical conditions**



A Paradigm Shift: Find the Triggers



- ▶ **ASD population continues to increase in size – epidemic**
 - ▶ **No genetic epidemics**
 - ▶ **Find the triggers causing the symptoms**
 - ▶ **Biomedical intake**
 - ▶ **Special laboratory workup**
 - ▶ **Individual treatment approach**
 - ▶ **Better outcomes in therapies**
 - ▶ **Treat the core problem... treat the medical condition... by first looking for the signs and symptoms of treatable issues**
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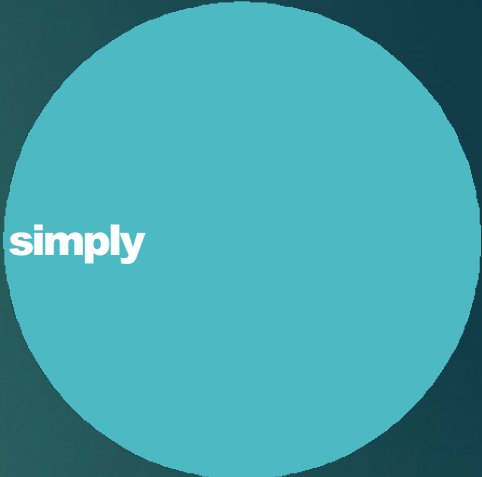


Autism is a Medical Condition...

... NOT A GENETIC DISORDER!

New Paradigm of Treating ASD



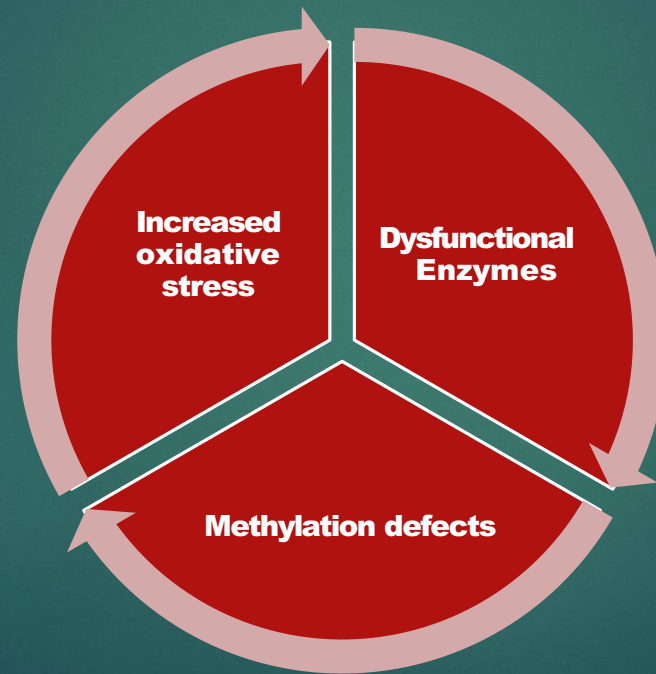
- ▶ **Genetic predisposition – environmental trigger**
 - ▶ **Complicated multisystem medical condition**
 - ▶ **Signs and symptoms are of medical conditions in ASD, not simply behavioral issues**
 - ▶ **Biomedical workup and treatment**
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Vicious Cycles in ASD

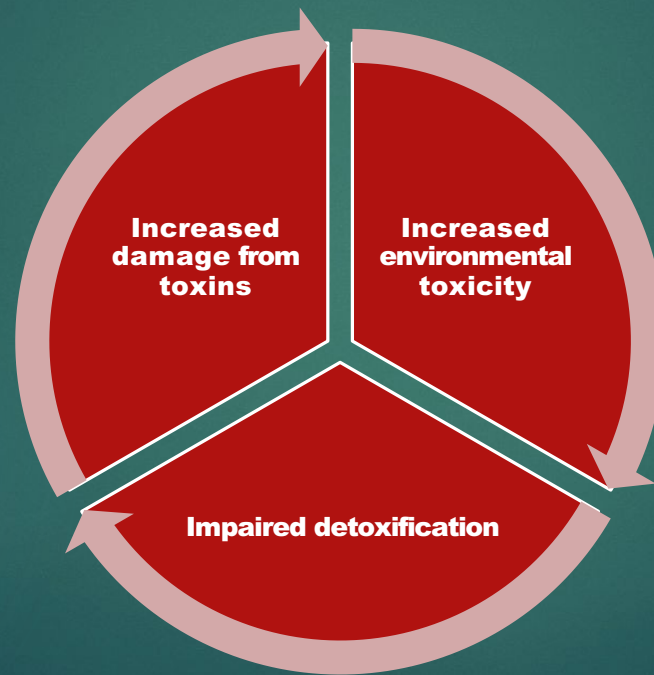
- ▶ **Methylation defects**
- ▶ **Impaired detoxification**
- ▶ **Gut dysfunction**
- ▶ **Immune system dysregulation**
- ▶ **All of the above vicious cycles... affect the brain**



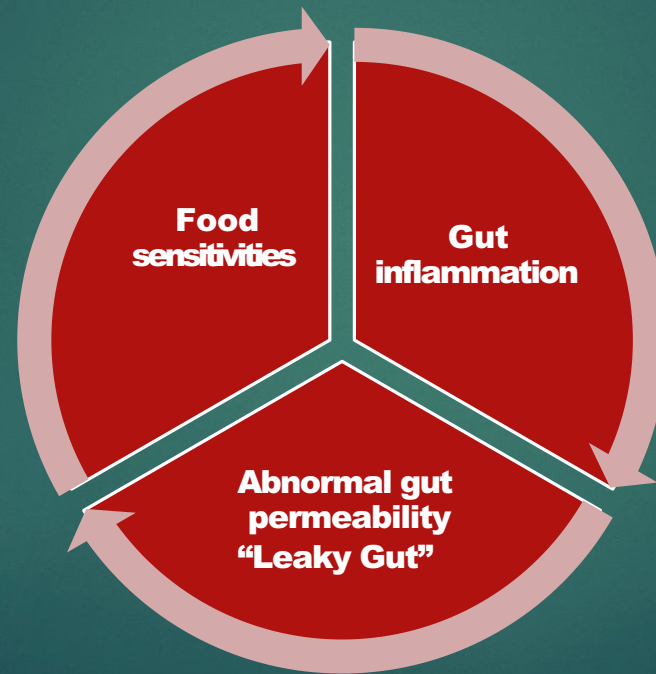
Vicious Cycle: Methylation



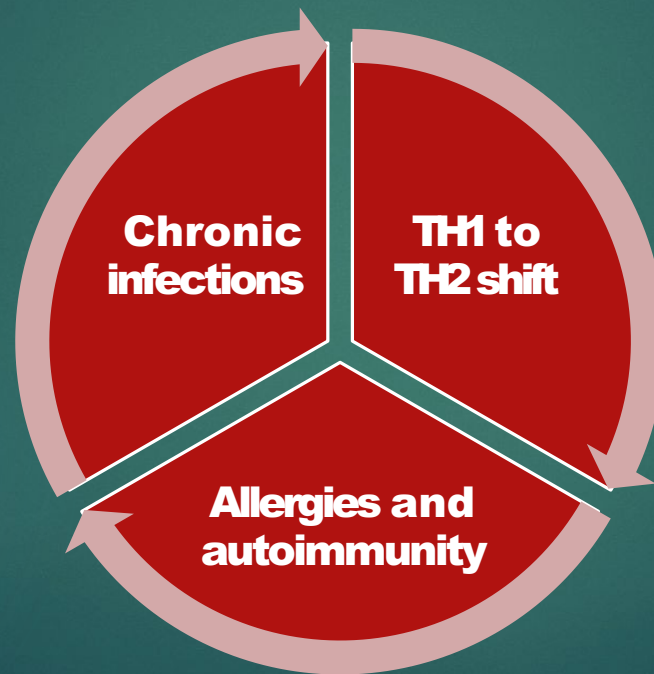
Vicious Cycle: Detoxification



Vicious Cycle: Gut




Vicious Cycle: Immune System



Review: Finding and Treating the Problems in ASD



- ▶ Find the treatable issues that are causing the signs and symptoms of ASD
 - ▶ Paradigm shift in evaluation and treatment
 - ▶ Find the triggers and treat the source of the problem...not just the "AUTISM"
 - ▶ **ASD is a multi organ system chronic health condition, ultimately affecting the brain**
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Metabolic Conditions in Autism

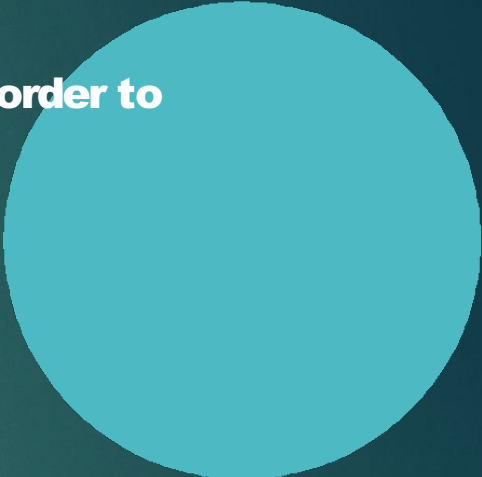
METHYLATION

DETOXIFICATION

MITOCHONDRIA

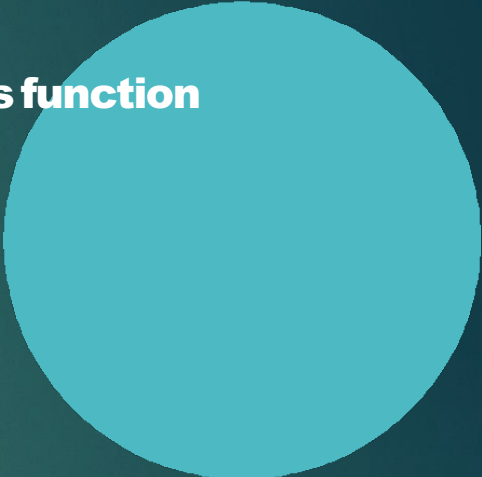
Defining Metabolism



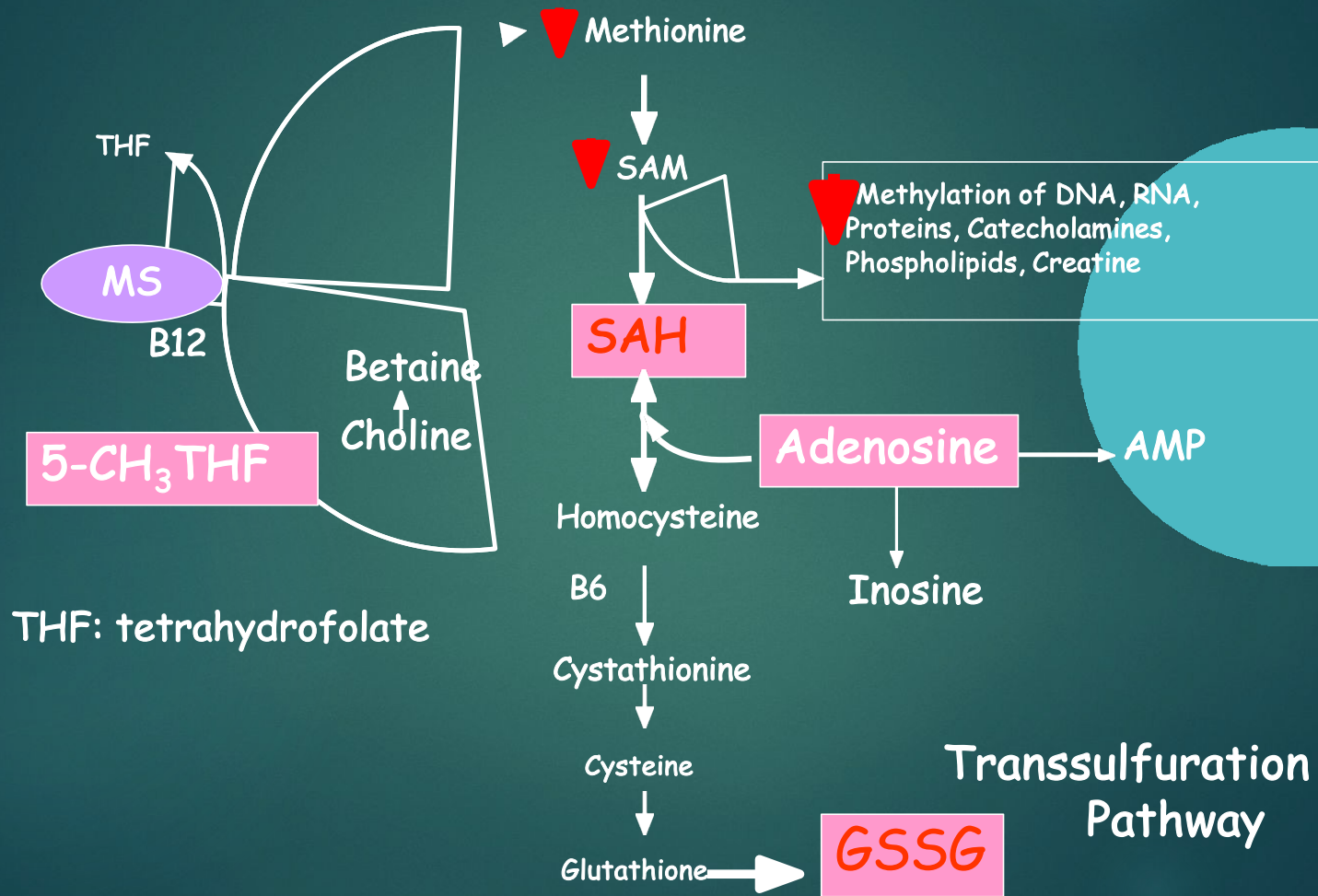
- ▶ **Chemical processes that occur within a living organism in order to maintain life**
 - ▶ **Key metabolic processes:**
 - ▶ **Methylation**
 - ▶ **Detoxification**
 - ▶ **Mitochondrial function**
- 

What is Methylation?



- ▶ **Attachment of a methyl group onto a protein changing its function**
 - ▶ **Methyl group – “currency of personality”**
 - ▶ **Body’s mechanism to regulate: genes and enzymes**
 - ▶ **Faulty methylation affects many body processes**
 - ▶ **Detoxification - our kids our toxic**
 - ▶ **Cognition - trouble with communication**
 - ▶ **Sleep**
 - ▶ **Production of neurotransmitters**
- 

Methylation Cycle/Oxidative Stress



Identifying the Signs and Symptoms of Faulty Methylation

- ▶ **Fatigue**
- ▶ **Lack of attention**
- ▶ **Lack of eye contact**
- ▶ **Poor concentration**
- ▶ **Anxiety**
- ▶ **Depressed moods**
- ▶ **Poor cognition**
- ▶ **Sleep issues**

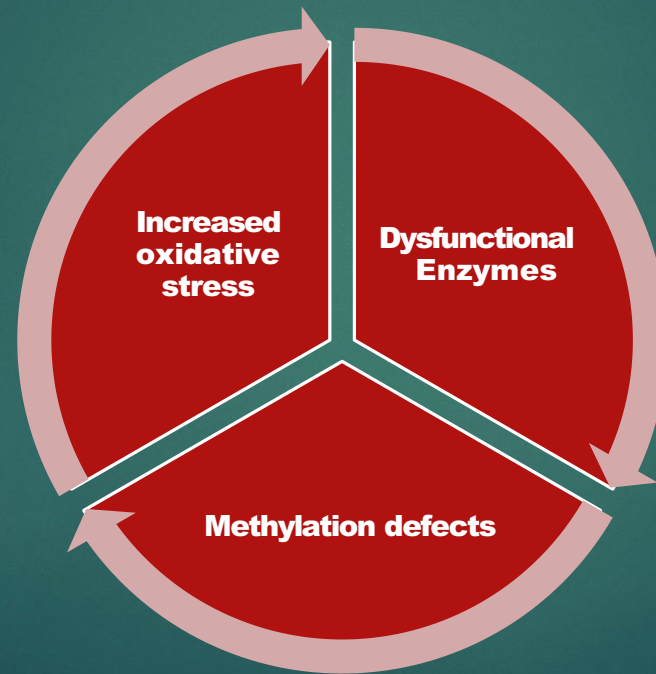


Methylation/Detoxification Treatment

- ▶ **5-MTHF/Folinic acid**
- ▶ **Methyl B12**
- ▶ **DMG/TMG**
- ▶ **B6/P5P**
- ▶ **Magnesium**
- ▶ **Antioxidants: Vit C/E, zinc, selenium**
- ▶ **N-acetyl cysteine - “NAC”**
- ▶ **Glutathione**
- ▶ **Chelation**



Vicious Cycle: Methylation



Impaired Detoxification

- ▶ **Oxidative stress**
- ▶ **Methylation the sink... detoxification the drain**
- ▶ **Lack of clearance of toxins**
- ▶ **Accumulation of heavy metals and other toxins**
 - ▶ **Increased “body burden”**
 - ▶ **Affect on enzymes (methionine synthase)**
- ▶ **Affects mitochondrial function**



Identifying Signs and Symptoms of Impaired Detoxification: Toxicity



- ▶ **Behavior changes**
- ▶ **Developmental delays**
- ▶ **Growth Delay**
- ▶ **Impaired coordination**
- ▶ **Headache**
- ▶ **Fatigue**
- ▶ **Neuropathic symptoms**
 - ▶ **nerve pain**
 - ▶ **numbness and tingling in extremities**

Treating Toxicity



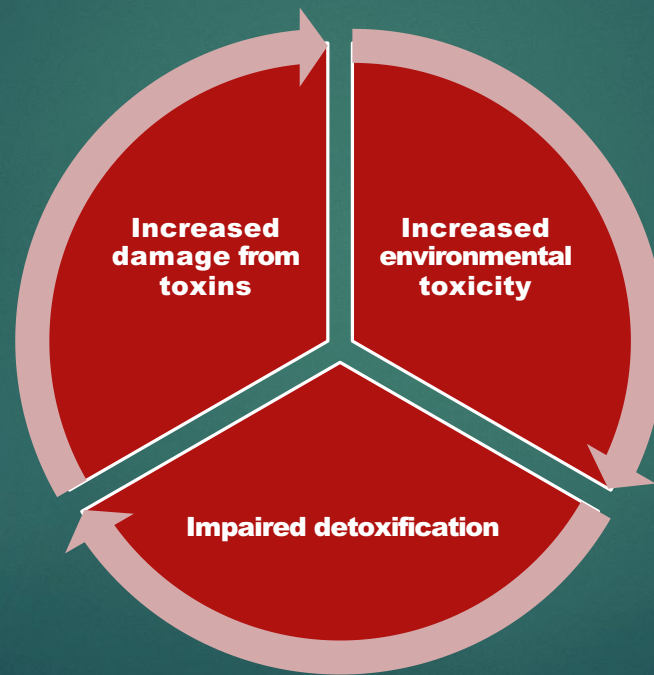
- ▶ **Get rid of the source**
- ▶ **Clean up your child's environment**
- ▶ *Non-Toxic-Guide to Living Healthy in a Chemical World, Aly Cohen, MD.*
- ▶ **Treat constipation first**
- ▶ **Good nutrition AND hydration**
- ▶ **Support METHYLATION**
- ▶ **Glutathione**
- ▶ **Chelation**
- ▶ **HBOT**

Treating Toxicity: Supplements



- ▶ **Support Methylation**
- ▶ **Zinc**
- ▶ **Bvitamins**
- ▶ **Vitamin C**
- ▶ **Herbals**
- ▶ **Taurine**
- ▶ **NAC-Glutathione**
- ▶ **Alpha Lipoic Acid**
- ▶ **Magnesium**
- ▶ **Epsom salt baths**

Vicious Cycle: Detoxification



Mitochondria



- ▶ **The “powerhouse”**
- ▶ **Found in every cell – generates Energy via ATP**
- ▶ **Identifying the signs and symptoms of mitochondrial dysfunction**
 - ▶ **“any symptom any organ any age”.**
 - ▶ **Motor delay, clumsiness**
 - ▶ **Hypotonia**
 - ▶ **GI motility issues**
 - ▶ **Fatigue**


Mitochondrial Interventions



- ▶ **CoQ 10**
- ▶ **Carnitine**
- ▶ **Bvitamins**
- ▶ **Methyl B12**
- ▶ **Antioxidants**
- ▶ **Detox support**
- ▶ **Dietary support**



Metabolism Review



- ▶ **Metabolism maintains life... has to be supported.**
 - ▶ **Individuals with ASD have faulty methylation**
 - ▶ **Faulty methylation leads to impaired detoxification**
 - ▶ **Toxicity leads to multisystem chronic disease**
 - ▶ **Protect and support mitochondria... “powerhouse”**
- 



Gastrointestinal Conditions in Autism

GI FUNCTION

SIGNS AND SYMPTOMS OF GI DYSFUNCTION

GI CONDITIONS IN ASD

The GUT: Start to Finish

- ▶ **Starting line**
 - ▶ **Nutritional intake**
 - ▶ **Digestion/absorption**
- ▶ **Finish line**
 - ▶ **Detoxification**
 - ▶ **Methylation defects**
 - ▶ **Glutathione deficiency**
 - ▶ **Elimination**
 - ▶ **Diarrhea**
 - ▶ **Constipation**



Identifying Symptoms of GI Dysfunction

- ▶ **Gas and bloating**
- ▶ **Abdominal pain**
- ▶ **Belching**
- ▶ **Heartburn**
- ▶ **Bowel movement frequency**



Identifying Signs of GI Dysfunction: Parents

- ▶ **Behavioral changes**
- ▶ **Toe walking**
- ▶ **Chronic infections**
- ▶ **Food reactions**
- ▶ **Rashes**
- ▶ **Diarrhea/Constipation**



Identifying Signs of GI Dysfunction: Physician



- ▶ **Food Reactions (Food Sensitivity Testing)**
 - ▶ Food sensitivity: IgG
 - ▶ Food allergy: IgE
 - ▶ Opiate effect of gluten/casein
- ▶ **Dysbiosis (overgrowth/imbalance) of bacterial flora in intestines (Stool testing)**
- ▶ **Candida and Clostridium overgrowth in the gut (Urine/Stool testing)**
- ▶ **Abnormal immune function**

GI Dysfunction: Conditions in ASD



- ▶ **Malnutrition**
- ▶ **Poor digestion**
- ▶ **GERD**
- ▶ **Diarrhea**
- ▶ **Constipation**
- ▶ **Celiac Disease**
- ▶ **Inflammatory Bowel Disease—
“Autistic Colitis”**



Other GI Related Issues

- ▶ **Leaky Gut**
- ▶ **Dysbiosis/
SIBO**
- ▶ **Yeast**
- ▶ **Clostridia**
- ▶ **Parasites**
- ▶ **Biofilm**




Constipation: Treatment Options



- ▶ **Bulking agents**
 - ▶ Dietary fiber - healthy diet not “just” GFDF
 - ▶ Supplements
- ▶ **Vitamin C**
- ▶ **Osmotics**
 - ▶ Magnesium oxide or citrate
 - ▶ Miralax
- ▶ **Aloe**
- ▶ **Stimulants:suppositories**
- ▶ **Enemas**


Diarrhea: Treat the Cause



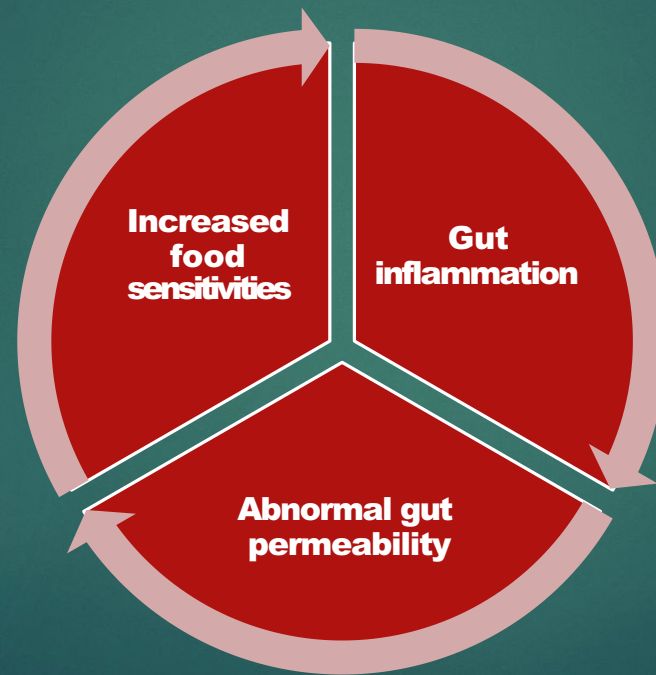
- ▶ **R/O infectious causes: parasites, bacterial**
 - ▶ **Dysbiosis/SIBO**
 - ▶ **Food allergy/intolerance**
 - ▶ **Constipation/encopresis**
 - ▶ **Supplements**
 - ▶ **(Too much vitamin C or magnesium)**
 - ▶ **Stress**
 - ▶ **Medical conditions: inflammatory bowel disease**
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Gut/Immune System Connection

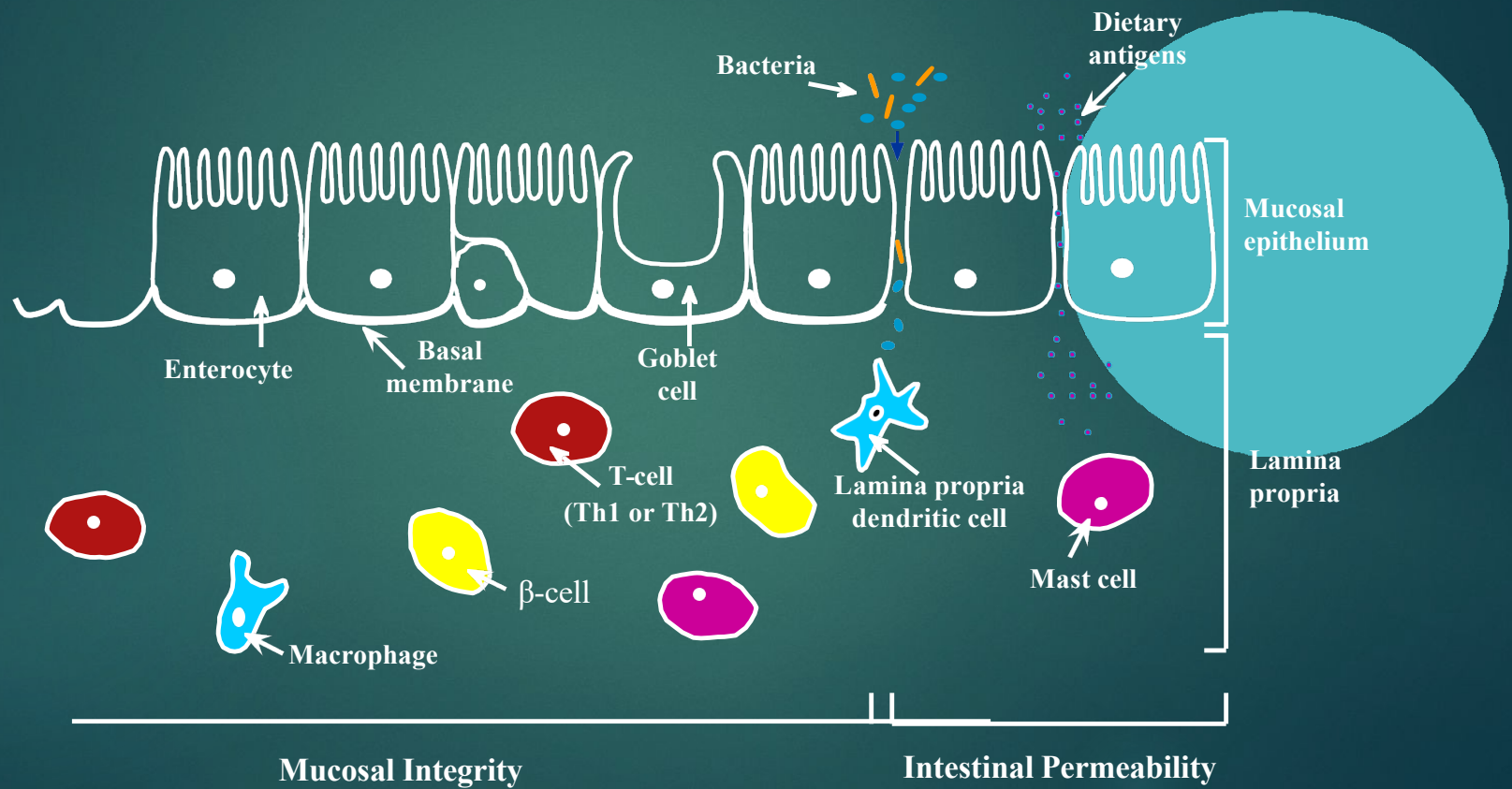


- ▶ Gut is the immune system's "command center"
 - ▶ Majority of immune function takes place in gut
 - ▶ Inflammation plays a key role – in the body's response to infection
- 

Vicious Cycle: Gut



Minding the GAPS!



Leaky Gut



- ▶ **Causes of increased intestinal permeability include:**
 - ✓ **Allergenic foods causing inflammation of cells**
 - ✓ **Incompletely digested food proteins (gluten/casein, etc.)**
 - ✓ **Medications:**
 - ✓ **Antibiotics – cause dysbiosis**
 - ✓ **NSAIDs – irritate mucosal lining**
 - ✓ **Other potential causes: heavy metals, yeast and bacterial overgrowth, various immune reactions**

Symptoms of Yeast Overgrowth



- ▶ **Inappropriate laughter**
- ▶ **Brain “fog”**
- ▶ **Sugar cravings**
- ▶ **Frequent urination**
- ▶ **Rashes**
- ▶ **Change in sleep pattern**
- ▶ **H/o antibiotic use**



Treatment for Yeast



- ▶ **Diet**
 - ▶ **Limit sugars**
 - ▶ **Limit starches**
- ▶ **Digestive enzymes**
- ▶ **Herbals**
 - ▶ **Grapefruit seed extract**
 - ▶ **Oil of oregano**
- ▶ **Probiotics**
- ▶ **S. Boulardii**
- ▶ **Rx antifungals**
 - ▶ **Nonsystemic (Nystatin)**
 - ▶ **Systemic (Diflucan/Fluconazole, Sporanox/Itraconazole)**

Symptoms of Clostridia Overgrowth



- ▶ **OCD like behaviors**
- ▶ **Self injurious behavior**
- ▶ **Aggressive**
- ▶ **Mucous in stools**
- ▶ **Diarrhea related to antibiotic treatment**



Parasites

▶ Symptoms

- ▶ Erratic behavior
- ▶ Worse at night
- ▶ Anal itching
- ▶ Increased appetite

▶ Treatment

- ▶ Probiotics
- ▶ Herbals
- ▶ Drugs:
 - ▶ Metronidazole
 - ▶ Mebendazole
 - ▶ Alinia
 - ▶ Ivermectin




SIBO

- ▶ **Small Intestinal Bowel Overgrowth**
- ▶ **Bacteria from colon migrate to small intestine**
- ▶ **“Bad” bacteria ferment carbs >>> gas**
- ▶ **Symptoms**
 - ▶ **Bloating/distention**
 - ▶ **Pain after eating carbs/sugar/grain/beans/fruits**
 - ▶ **Chronic abdominal pain**
- ▶ **Treatment: Diet**
 - ▶ **SCD**
 - ▶ **GAPS**
 - ▶ **Low FODMAPS**



GI Review



- ▶ **The “GUT” and brain are intimately connected**
 - ▶ **Dysfunctional GI system can lead to immune system dysregulation**
 - ▶ **Important to pay close attention for signs and symptoms of GI dysfunction and treat them**
 - ▶ **Symptoms of GI dysfunction often the source of negative behaviors in ASD**
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Other Conditions in Autism

IMMUNE SYSTEM DYSREGULATION

PANDAS

AUTONOMIC DYSFUNCTION

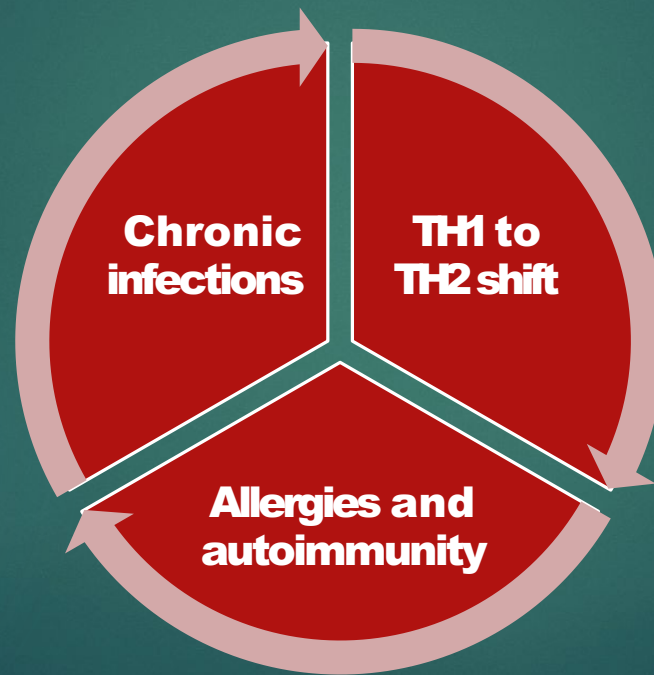
Immune System Dysregulation



- ▶ **Immune dysregulation**
 - ▶ **Allergies – seasonal, food, etc**
 - ▶ **Frequent infections – bacterial, viral, fungal**
- ▶ **Chronic inflammation...chronic disease**
- ▶ **Autoimmune reactions**
 - ▶ **Gut lining**
 - ▶ **Brain proteins**



Vicious Cycle: Immune System



PANDAS (Autoimmune Encephalitis of the Basal Ganglion)

- ▶ **P – Pediatric**
- ▶ **A – Autoimmune**
- ▶ **N – Neuropsychiatric**
- ▶ **D – Disorder**
- ▶ **A – Associated with**
- ▶ **S- Strep**



PANDAS: Symptoms



- ▶ **Autoimmune – “friendly fire”**
- ▶ **Molecular mimicry**
- ▶ **Symptoms:**
 - ▶ **Choreiform movements**
 - ▶ **Tics**
 - ▶ **Anxiety/OCD**
 - ▶ **Aggression/agitation**
- ▶ **PITANDS – infection triggered**
- ▶ **PANS – acute onset neuropsych syndrome**

PANDAS: Treatment

- ▶ **Probiotics**
- ▶ **Vitamins A and D**
- ▶ **Anti-inflammatories**
- ▶ **Antihistamines**
- ▶ **LDN- Low dose Naltexone**
- ▶ **Antibiotics**
 - ▶ **Long courses**
 - ▶ **Pulse dosing**



PANDAS Treatment cont

- ▶ **Antioxidants**
- ▶ **Essential Oils**
- ▶ **Zinc**
- ▶ **SSRIs**
- ▶ **Antipsychotics**
- ▶ **IVIG**



Identifying Signs and Symptoms of Viral Infection



- ▶ **Poor color**
- ▶ **Ill appearing**
- ▶ **Fatigue**
- ▶ **Skin findings:**
 - ▶ **Apthous ulcers**
 - ▶ **Warts**
 - ▶ **Rashes**

Antiviral Therapy



- ▶ **Immune support/anti-inflammatories**
 - ▶ **LDN**
- ▶ **Vitamin A**
- ▶ **Herbals- Andrographis**
- ▶ **Prescription antivirals**
 - ▶ **Acyclovir**
 - ▶ **Famvir**
 - ▶ **Valacyclovir**

Review: Immune System Dysfunction in ASD

- ▶ Immune system dysregulation a factor in many conditions in individuals with ASD
- ▶ PANDAS type reaction can be triggered by bacteria, virus, or environmental trigger
- ▶ Lyme can be a factor even when rash never detected... multisystem condition



Brain Inflammation

- ▶ **Mast cells – “immune gate to the brain”**
- ▶ **ASD**
 - ▶ **Increased inflammation**
 - ▶ **Increased autoimmunity**
- ▶ **Activation of microglia**
 - ▶ **Brain’s “immune cells”**
 - ▶ **Causing inflammation**
 - ▶ **“Choking” of neuronal connectivity**



Stress Causing Brain Inflammation?

- ▶ **Disrupts blood brain barrier**
- ▶ **Opens up blood brain barrier**
- ▶ **Stimulates mast cells**
- ▶ **Triggers microglia cells**



Adrenal/Autonomic Dysfunction




- ▶ **HPA axis**
 - ▶ **Hypothalamus**
 - ▶ **Pituitary**
 - ▶ **Adrenals**
- ▶ **HPA dysfunction another source of ASD symptoms**
- ▶ **Chronic “fight or flight”**



Adrenal Stress Syndrome



1. **Adrenal hypo-function**
 2. **Low cortisol – low blood sugar at night**
 3. **Stress response triggered**
 4. **Epi/norepi secreted to mobilize glucose**
 5. **Activation of sympathetic nervous system: nighttime awakening**
- 

Affects of Adrenal Stress

- ▶ **Reduced GI secretory IgA**
- ▶ **Thinning of GI lining**
- ▶ **Decreased GI motility**
- ▶ **Reduced mitochondrial function**
- ▶ **Impacts thyroid hormone conversion**




Identifying Symptoms of Dysautonomia

- ▶ **Sleep issues**
- ▶ **Abnormal sweating**
- ▶ **Excessive urination and thirst**
- ▶ **Salt cravings**
- ▶ **Disequilibrium**
- ▶ **Dysmotility: constipation/diarrhea**



Regulating Adrenal Stress



- ▶ Try to relieve adrenal “stress”... while treating symptoms of it
 - ▶ Breathing
 - ▶ Meditation/ prayer/ **singing**
 - ▶ Healthy diet
 - ▶ Good bedtime routine
 - ▶ Relax! Slow down...
- 

Treating Dysautonomia

- ▶ **Clean up environment**
- ▶ **Low glycemic index diet**
- ▶ **Small frequent meals**
- ▶ **Bedtime snack with protein**
- ▶ **Exercise**



Treating Dysautonomia cont.

- ▶ **Methylation support**
- ▶ **Phosphatidylcholine**
- ▶ **Oxytoxin**
- ▶ **Beta Blockers (Propranolol)/Alpha Agonists**
- ▶ **Ashwagandha**



Review: Nervous/Endocrine Dysfunction in ASD

- ▶ **Oxidative stress, emotional stress, and inflammation all affect brain function**
- ▶ **Neurological dysfunction can lead to adrenal dysfunction leading to additional behavioral challenges in ASD**
- ▶ **We should all be aware of signs/symptoms of adrenal issues... PARENTS included**



Biomedical Approach to ASD


BIOMEDICAL EVALUATION

THE 3 R'S

CONCLUSIONS

Biomedical Evaluation



- ▶ **MAPS practitioner**
 - ▶ **Intake – in depth process**
 - ▶ **Questionnaire**
 - ▶ **Physical exam**
 - ▶ **Individualized treatment plans**
 - ▶ **Lab Evaluation: specialty labs**
 - ▶ **“Follow up” critical to the process**
 - ▶ **Marathon... not a sprint!**
- 

Finding the source...

- ▶ **Impaired methylation/detoxification**
- ▶ **Unhealthy GUT**
- ▶ **Immune dysfunction/inflammation**
- ▶ **Infections (viral, fungal, bacterial, parasites)**
- ▶ **Food Intolerance/Allergies**
- ▶ **Oxidative stress and brain dysfunction**
- ▶ **Neurotransmitter/Autonomic dysequilibrium**
- ▶ **Mitochondrial dysfunction**
- ▶ **Adrenal imbalance**



Biomedical Approach

- ▶ **Get rid of what is hurting them (what's the core issue?)**
- ▶ **Give them more of what they need (biomedical treatment)**
- ▶ **Break the vicious cycles!**



Spectrum Treatment Approach: the 3 R's

- ▶ **Remove**
- ▶ **Replenish**
- ▶ **Repair**



Remove



- ▶ **Foods**
 - ▶ **Gluten/Casein/Processed foods**
 - ▶ **Food sensitivities (IgG)**
 - ▶ **Get rid of all things... “fake”**
- ▶ **Bugs**
 - ▶ **Bacteria - antibiotics**
 - ▶ **Virus – antivirals**
 - ▶ **Fungus – antifungal parade**
- ▶ **Toxins**
 - ▶ **Methylation support**
 - ▶ **Detox support**
 - ▶ **It starts in the home...**

Repair



- ▶ **Repair methylation/detoxification**
 - ▶ **Methyl B12**
 - ▶ **Magnesium/B6/Zinc**
- ▶ **Repair the GUT**
 - ▶ **Restore GUT flora**
 - ▶ **Repair the GUT wall/Biofilms**
- ▶ **Repair the Immune System**
 - ▶ **Reset body's "radar"**
 - ▶ **Reduce inflammation**
- ▶ **Repair damaged tissue**
 - ▶ **HBOT**

Replenish

- ▶ **Nutrients**
 - ▶ **Real food!**
 - ▶ **Special diets**
 - ▶ **Supplements**
- ▶ **Digestive Enzymes**
- ▶ **Probiotics**
- ▶ **Essential fatty acids**



Conclusions



- ▶ **Identifying the signs and symptoms of the medical conditions that cause the symptoms of ASD is critical**
- ▶ **Shifting to a biomedical approach allows you to treat your child's condition, not just their symptoms**
- ▶ **Biomedical approach "sets the table" ... for success in other therapies**
- ▶ **NAA... get involved!**
- ▶ **Find a MAPS doctor!**