If We'd Known Then What We Know Now:
A Fresh Approach to
Treating Root Causes of Autism

Mensah Medical

- Outpatient medical clinic
- Research affiliation with Walsh Research Institute
- Expertise in biochemical therapy
- International physician training

Clinical Experience

- 10,000 Behavior & ADHD
- 6,500 Autism Spectrum Disorder
- 6,500 Mental Illness

Mensah Medical and Pfeiffer Treatment Center, Warrenville, IL, 1989 to present

History of Autism

- **Early 1900s** – Autism referred to a range of psychological conditions (schizophrenia)
- **1940s** – Autism was used to describe children with emotional or social problems caused by poor parenting.
- **1960s and 1970s** – Treatment relied on pain and punishment, i.e., LSD, electric shock and behavior change techniques.
- **1980s and 1990s** – Behavior therapy and highly controlled learning environments became primary treatments.
- **Today** – Research and treatment focuses on genetic and environmental factors, behavioral therapy, nutrients, dietary changes and more.

The Brain is a Chemical Factory

- Neurotransmitters (NT) and neurological inhibitors, such as serontonin, dopamine and GABA, are critical to brain function. Internal or external factors may deplete the brain of neutrotransmitters stimulating it to produce excess amounts or too little. What occurs: **a biochemical imbalance**.
- Imbalances in the brain's chemistry can give rise to mood disorders, learning disabilities, autism spectrum disorders, substance abuse, muscle weakness and other issues.
- Serotonin, dopamine, and other neurotransmitters (NT) are synthesized in the brain from amino acids, vitamins, and minerals.

Biochemical Individuality

- Humans are genetically and epigenetically diverse.
- Because of genetics and epigenetics, <u>most</u> people are deficient in several nutrients and overloaded in others.

Autism Spectrum Database

- About 90 to 150 assays of chemical factors in blood, urine or hair for each of 6,500 patients
- More than 800,000 chemical test results
- Comparison with known "normal" levels

Distinctive Features of Autism

- Biochemical Imbalances
- Incomplete Brain Development
- Strong Genetic Disposition
- Onset after Environment Insult
- High Oxidative Stress
- Gut-Brain Connection

Oxidative Stress and Autism

- Excessive oxidative stress is evident throughout the autism spectrum.
- An Oxidative Stress Model can explain most symptoms of autism.
- Most autism therapies have antioxidant properties.
- Oxidative stress has become a leading focus of autism research.

High Incidence Biochemical Abnormalities in Autism

- Low levels of Glutathione & Cysteine
- Elevated Toxic Metals
- Depressed SAMe/SAH Ratio
- High Copper and Low Ceruloplasmin
- Depleted Zinc and Metallothionein
- Elevated Pyrroles
- Low B-6, C, Selenium and Others
- Elevated Urine Isoprostanes

Note: Each of these imbalances is associated with elevated Oxidative Stress.

Zinc Deficiency

- Zinc (Zn) is needed for regulation of GABA in brain.
- GABA is a "calming" NT that combats overloads of norepinephrine.
- Zinc deficiency is a characteristic of autism.
- Zinc deficiency is associated with irritability, anxiety, explosive temper, violent or aggressive behavior.

Methylation

- Methylation, methionine and folates
- It impacts every important organ function, i.e., balance, blood pressure, pulse, respiratory, G.I. and urinary tract function
- Epigenetics, genetics and oxidative stress

Over/Under-Methylation

- **Over-Methylation** – associated with anxiety, depression, under-achievement, upper body pain, chemical and food sensitivities.
- **Under-Methylation** – associated with OCD, ODD, seasonal depression, perfectionism and competitiveness.

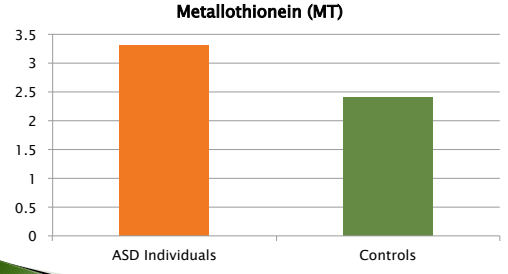
Metal Metabolism

- Genetic inability to control copper, zinc, manganese and other trace metals
- Core problem – improper functioning of metallothionein (MT) protein.

Metallothionein (MT)

- A family of four low-molecular-weight, cysteine-rich proteins that have potent metal binding and redox capabilities and are involved in early brain development.
- Provide powerful antioxidant properties and work together with glutathione and selenium to protect against toxic metals.

Low MT Levels in Autism: $p < 0.0092$



Why is Metallothionein Important?

- Required for development of brain cells and synaptic connections.
- Prevents Hg, and other metal toxics from passing intestinal and blood/brain barriers.
- Required for homeostasis of Cu and Zn.
- Supports immune function.

MT functioning can be *disabled* by excess oxidative stress.

Consequences of Oxidative Stress: Mirror Classic Symptoms of Autism

- Hypersensitivity to Hg and other toxic metals
- Hypersensitivity to certain proteins (i.e., casein, gluten)
- Poor immune function
- Disruption of the methylation cycle
- Inflammation of the brain and G.I. tract
- Depletion of glutathione and metallothionein
- Excessive amounts of "unbound" copper

Oxidative Stress Can Impair Brain Development

- NT is required for pruning, growth and growth-inhibition of brain cells in early development.
- Ample GSH is required for proper MT function.
- MT and GSH are depleted in autism.
- High oxidative stress depletes MT and GSH.

Consequences of Oxidative Stress Overload in the G.I. Tract

- Destroys digestive enzymes needed to break down casein and gluten.
- Increases candida/yeast levels.
- Diminishes Zn levels and production of stomach acid.
- Produces inflammation.
- Results in a "leaky" intestinal barrier allowing toxics to enter the bloodstream.

Autism Rates: A Continuing Medical Mystery

- Strong genetic predisposition: greater than 60% concordance in identical twins; less than 10% concordance in fraternal twins.
- Dramatic increase in autism cases over the past 50 years.
- Autism rates continue to escalate – One in every 88 children in the U.S. has autism (5xs more common in boys: 1 in 54)

The Role of Environment

Concordance of only 60-80% in identical twins indicates that environment plays a major role.

Conclusion: Since DNA mutations can take centuries to develop, the autism epidemic has been attributed to changes in environment.

The Recipe for Autism

1. Genetic Predisposition
2. Environmental Insult

Environmental Insults: A Multitude of Possibilities

1. Attention has been focused on direct insults to the child from conception to age 3.
2. More than 25 environmental insults have been proposed, including mercury exposures, vaccines, changes in diet, viruses, increased Cu in the water supply, etc.

Chelation and Oxidative Stress

- DMSA and DMPS are powerful antioxidants.
- Chelation can provide antioxidant benefits even if toxic metals are not present.
- For many patients, the primary benefits of chelation result from antioxidant properties, and not from removal of Hg or other metals.
- Antioxidant benefits from chelation appear to "fade away" after about 2-4 weeks.

Limitations of Chelation

- Does not fix intestinal or blood/brain barriers
- Antioxidant benefits are temporary (lasting only 2 to 4 weeks)
- May not remove toxic metals from brain
- Complicates Zn management

A New Explanation: Epigenetics

- Environmental insults during the first month of gestation can produce abnormalities in gene expression that may persist throughout life.
- In some cases, these abnormalities can be transferred to future generations.
- This could result in a geometric increase in the number of autism-prone families.

Epigenetic Processes During Early Fetal Development

- Every cell has the potential for expressing any of the >20,000 genes in DNA
- In utero chemical environment determines which genes will be expressed or inhibited throughout life (bookmarking)
- Gene expression tendencies can be transmitted to future generations by a process called transgenerational epigenetic inheritance (TEI)
- Methylation is a primary factor in TEI, and is abnormal in individuals with autism.

Behavioral Therapies

Applied Behavior Analysis (ABA)

- Stimulates organization of synaptic connections and cortex minicolumns
- Promotes brain maturation but is greatly slowed by oxidative overload and inflammation
- Especially promising when coupled with antioxidant therapy

Metallothionein-Enhancement Therapy

Unique Advantages:

- Directly aimed at development of brain cells
- Potential for permanently correcting the intestinal and blood/brain barriers
- Restores a key antioxidant system

Limitation: Does not directly enhance development of dendrites and synapses

Benefits of Chelation

- Rapid removal of toxic metals
- Powerful antioxidant
- Mensah Medical Natural Chelation

Mensah Medical Approach

- Medical history and review of symptoms
- Extensive chemical testing and possibly allergy testing
- Diagnosis of biochemical imbalances
- Prescribed ***individualized***, nutrient program aimed at normalizing body-brain levels:
  - Prebiotics and probiotics
  - Digestive enzymes and antifungals
  - Metallothionein-Enhancement Therapy
  - "Natural", safer chelation
  - Avoidance of gluten, casein, etc., as needed

Populations with Positive Outcomes to Biochemical Therapy

- Behavior Disorders
- Learning Disorders, i.e., ADD, ADHD
- Autism
- Anxiety
- Obsessive-Compulsive Disorder
- Eating Disorders
- Depression
- Bipolar Disorder
- Schizophrenia
- Alzheimer's disease, Parkinson's Disease

- Main Clinic – 25 miles west of Chicago
- U.S. Outreach Clinics:
  - Garden Grove, CA (near Anaheim): ***August 21 and 22, 2012***
  - Burlingame, CA (near San Francisco) ***October 9 and 10, 2012***
  - Scottsdale, AZ: ***November 6 and 7, 2012***
  - Annapolis, MD: ***June 19 and 20, 2012***

THANK YOU!

QUESTIONS AND ANSWERS