“Underlying” Factors in Autism
A Functional Medicine Approach
A Pediatrician Sees the Light

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Autism Captures a Heart

• 31 years private pediatric practice
• 11 years academic pediatrics
• Discovered world of Functional Medicine (healing vs “treating”)
• November 2013 retired from mainstream Peds
• Two conditions “I won’t deal with” = autism and Lyme disease
• May 2015 AutismOne → YOU (parents, your children, and your therapists) captured my heart
# ASD – Magnitude of the Problem

## From FDA’s Consumer Updates page

### April 25, 2014

### Identified Prevalence of Autism Spectrum Disorder

**ADDM Network 2000-2010**

Combining Data from All Sites

<table>
<thead>
<tr>
<th>Surveillance Year</th>
<th>Birth Year</th>
<th>Number of ADDM Sites Reporting</th>
<th>Prevalence per 1000 Children (Range)</th>
<th>This is about 1 in X children...</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>1992</td>
<td>6</td>
<td>6.7 (4.5 – 9.9)</td>
<td>1 in 150</td>
</tr>
<tr>
<td>2002</td>
<td>1994</td>
<td>14</td>
<td>6.6 (3.1 – 10.6)</td>
<td>1 in 150</td>
</tr>
<tr>
<td>2004</td>
<td>1996</td>
<td>8</td>
<td>8.0 (4.5 – 9.0)</td>
<td>1 in 125</td>
</tr>
<tr>
<td>2006</td>
<td>1998</td>
<td>11</td>
<td>9.0 (4.2 – 12.1)</td>
<td>1 in 110</td>
</tr>
<tr>
<td>2008</td>
<td>2000</td>
<td>14</td>
<td>11.3 (4.8 – 21.2)</td>
<td>1 in 88</td>
</tr>
<tr>
<td>2010</td>
<td>2002</td>
<td>11</td>
<td>14.7 (5.7 – 21.9)</td>
<td>1 in 68</td>
</tr>
</tbody>
</table>
Autism $$ Costs

• Average cost per year $60,000 per family
  - - - AutismSpeaks 2013

• Lifetime cost to family estimates as high as $1.4 million  - - - JAMA Pediatrics June 2014

• 2012 NIH budget $30.86 billion → $169 million for autism research

• $1 billion spent on autism research 2005-2015 “but tangible benefits are elusive”
  - - - Gary Maffei, Exec. Dir. Quality Services for the Autism Community (QAAC)
Causes of ASD

General principles

• No established single cause for ASD
• Multiple contributing causal factors including genetic and environmental
• No two autistic children are exactly alike
• Causal factors include those characterized in at least 8 categories, working together in various combinations (next slide)
### Causal Factors in ASD

<table>
<thead>
<tr>
<th>Genetics and Single nucleotide polymorphisms</th>
<th>Biochemical functional abnormalities</th>
<th>Nutritional deficiencies</th>
<th>Mitochondrial dysfunction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fragile X</td>
<td>Cholesterol level (low)</td>
<td>Essential Fatty Acids</td>
<td>Present in significant percent of ASD subjects</td>
</tr>
<tr>
<td>Deletions of chromosome 15q</td>
<td>Amino acid abnormalities</td>
<td>B vitamins – especially B6 and B12</td>
<td>One study found in 80% of ASD subjects</td>
</tr>
<tr>
<td>Tuberous sclerosis</td>
<td>Urea cycle defects</td>
<td>Iron</td>
<td></td>
</tr>
<tr>
<td>Methylation (Single nucleotide polymorphisms)</td>
<td></td>
<td>Magnesium and Calcium</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Zinc and Copper ratio</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vitamins A, C, D, E, and K</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Carnitine levels</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Immune function</th>
<th>Chronic infections</th>
<th>Gut dysbiosis, inflammation</th>
<th>Toxins</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic inflammation</td>
<td>Bacterial infections (Lyme, others)</td>
<td>Studies show varying percentages of ASD children (9% to 90%) have GI symptoms and one large study found 12.6 had a diagnosed disorder</td>
<td>Heavy metals (mercury, cadmium, others)</td>
</tr>
<tr>
<td>Th1/Th2 shift</td>
<td>Viral infections</td>
<td></td>
<td>Pesticides</td>
</tr>
<tr>
<td>Immune substances (cytokines, etc) released in body</td>
<td>Parasites (90% of people have parasites in their body – most don’t know.) Can produce neuro-toxic chemicals</td>
<td></td>
<td>Other chemicals</td>
</tr>
<tr>
<td>Vaccines (multiple simultaneous antigens and/or adjuvants including mercury and aluminum)</td>
<td></td>
<td></td>
<td>Vaccines</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Adjuvants (aluminum, mercury)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>?? additional components</td>
</tr>
</tbody>
</table>

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The V Word

• AAP, CDC, other organizations: “Vaccines are safe and effective” (unqualified)
• “We don’t know what causes autism, but we know it is not caused by vaccines” = Logical contradiction!
• US Supreme Court (2011) “Vaccines are unavoidably unsafe.”
• Ryan Mojabi’s parents awarded >$990,000 via NVICP (2012) ASD as result of MMR
• Hannah Poling’s parents awarded for autism cause by vaccines, secondary to mitochondrial disease (next slide)
Vaccine Risk Factors
Mitochondrial Dysfunction

- Rossignol and Frye review 112 studies 5% of ASD children had MC disease + up to 1/3 more biological evidence of MC dysfunction – 1 in 10,000 in general population with same
  - Molecular Psychiatry 2012
- No practical and reliable method to detect MC dysfunction at time of vaccines
- Current vaccine schedule never studied for risks of simultaneous administration of vaccines included
- Vaccine trials controls receive aluminum adjuvant

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Additional Risk Factors

- Illness at time of vaccination
- Administration of acetaminophen before or after vaccines (depletion of glutathione and impaired detoxification)
- Pre-existing undetected immune dysfunction
- Prenatal toxin exposure (study cord blood of 10 newborns over 200 chemicals in each)
- Gastrointestinal dysbiosis?
So Do Vaccines Cause Autism?

• Unqualified “yes” and “no” both inaccurate and oversimplified
• Documented to have done so in at least a few cases and in many more to have contributed – “the straw that broke the camel’s back”
• Increased risk if Mitochondrial dysfunction, certain genetic variants (single nucleotide polymorphisms), and possibly toxin exposure
Behavioral Therapies
Applied Behavioral Analysis (ABA)

• Research supported but expensive - $30,000 to $60,000 per year but insurance may cover
• Time consuming – often up to 40 hours/week
• Usual impact reported clinically modest

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Behavioral Therapies
Son-Rise Program Raun Kaufman

*Autism Breakthrough* (2015)

- Created by parents of an autistic child
- Social-relational approach
- Raun Kaufman dx as severely autistic as boy (IQ below 30)
- Degree in Biomedical Ethics Brown University
- Autism expert and educator with no trace of autism

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Behavioral Therapies
Davis Autism Approach

- Developed by Ron Davis, b 1942, severely autistic, “uneducable” but IQ 137 by age 17
- Successful as engineer and in business despite remaining functionally illiterate until age 38
- Developed Davis Dyslexia approach, then Davis Autism Approach – worldwide
- Experiential corrective approach with parent trained to work with child
- High initial expense but minimal ongoing
- Child must by age 7 and able to perform cognitive tasks

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Biomedical Treatment of ASD

BioMedical Approach

Clean Up-Diet, Environment  Gastro-Intestinal Issues  Methylation cycle  Nutrition support  Fungus/Virus

Immune system  Oxidative stress  Detoxification  Neuro inflammation

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Biomedical Treatments
An Overview outline

• Diet and Environment
• GI — Gastritis, GERD, Colitis, Irritable Bowel Syndrome, Constipation, Motility-based disorders, Food reactivity, Dysbiosis, Leaky Gut
• Methylation Cycle Impairment (70%)
• Chronic Infections (fungal, viral, bacterial, lyme)
• Immune system dysfunction
• Detoxification
• Oxidative stress
• Neuro-inflammation

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ASD and Lyme

- Lyme experts (Klinghardt, others) report finding Lyme in significant percentage of ASD patients
- Similar biochemical and physiological abnormalities found in both
- Methylation impairment common in both
- Lyme treatment followed by improvement or resolution of ASD
- All 6 steps in Keri Rivera’s protocol for healing Autism reported to help in treating Lyme Disease (next slide)
Shared Functional Disturbances
ASD and Lyme

- Methylation Impairment (single nucleotide polymorphisms)
- Toxin effects – heavy metals, other
- Chronic infection (parasites, viruses)
- Mitochondrial dysfunction
- GI dysfunction and Leaky Gut
- Immune system dysfunction with cytokine production

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The important fact here is that Lyme disease and autism share symptoms in common not just with many illnesses, but with the same set of many illnesses.
ASD and Lyme
Treatment Similarity

Keri Rivera Protocol — and — Lyme Treatment

1. Diet — GFCF low carb “paleo” organic
2. Chlorine Dioxide* → ?? ASEA water
   *Not approved by FDA, controversial
3. Anti-parasite treatment
4. Supplement regimen — many similar ones
5. HBOT
6. GcMAF *Not approved by FDA, restricted from being used in U.S
ASD and Lyme
Additional Similar Treatments

• PEMF
• RIFE
• OZONE
• ESSENTIAL OILS
• HERBAL TREATMENTS
• HEAL LEAKY GUT (Eliminate allergenic foods, Probiotics, Enzymes, Colostrum)
• DETOXIFICATION
• LDN (Low Dose Naltrexone)
• REDUCE EMF EXPOSURE (next slide)
"One of my primary treatments for Lyme disease is to put people in protective clothing that shields them from incoming microwaves," he says. "We shield the bedside. We turn off the wireless internet at home. We put shielding paint on the houses. That has been a more successful strategy to treating Lyme disease and to get people neurologically well than any of the antibiotics or any of the antimicrobial compounds."
Non-standard Therapies
Nothing New Under the Sun

• **CD** — Minimal cost, minimal risk – Water treatment 1940s, EPA recommending CD over chlorine bleach for water treatment 1970s, FDA reg as sterilizer = safe and effective for hospitals, healthcare facilities, and labs

• **PEMF** — FDA approved as adjunct for cervical fusion surgery for high risk pts and for Rx drug-resistant depression in 2011
• Thousands of peer reviewed studies over 40 years

• **RIFE** — used for cancer in 1930s
• *Therapists forbidden to use but citizens can purchase and use

• **OZONE** — since the 1940s, the FDA and AMA have come down hard on ozone therapy in the USA – but legislation protects use in 12 states

• **HBOT** — Clinical use in 1960s . . .

• **Essential Oils** — Used since Biblical times

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ASD Prevention
Mumper Prospective Study

• Prospective study 294 consecutive children born from July 2005 through March 2011
• No new cases of autism compared to several autistic children among a total patient volume 1/4\textsuperscript{th} that of integrative practice preventive approach during study
• According to 2014 CDC estimate of autism frequency (1 in 68 children, 1 in 42 boys), would expect at least 4 cases of ASD
• \textit{--- Journal of Medicine and Science} July, 2013

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Autism Prevention
Mumper Protocol Part I

• Minimizing environmental toxin exposure
• Maximizing breastfeeding
• Probiotics
• Nutritional counseling
• Pre-natal vitamins containing folic acid, ideally in the active form such as 5 methyl-tetrahydrofolate
• Eating locally grown organic fruits, vegetables, and protein as much as possible
Autism Prevention Protocol
Part II

- Avoiding processed foods, preservatives, monosodium glutamate, aspartame, and nitrites
- Avoiding mercury-containing fish.
- Restricting antibiotic usage when possible
- Avoiding use of acetaminophen
- Allowing/implementing a modified vaccine schedule
Modified Vaccine Schedule  
(Mumper, Herbert, Corbier)

- Space out to minimize number of vaccines administered concurrently
- Avoid administration during fever or illness
- Avoid administration of acetaminophen before or after vaccines (depletes glutathione)
- Request preservative-free (thimerosal) vaccines from single-dose vials when available
- Build immune system (vitamin C, probiotics) before and after
- Avoid newborn hepatitis B vaccine (225 mcg Al)

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Autism Prevention
Vitamin D

From *Vitamin D Theory of Autism* (Cannell 4/24/09):

- Inflammation common in ASD and vitamin D deficiency with similar increased cytokines
- Vitamin D increases Glutathione → helps HM detox (Hg)
- Depakote lowers vitamin D and associated with autism
- Estrogen enhances vitamin D metabolism while testosterone does not. Testosterone is much higher during pregnancy in males → ? Explain 4:1 M:F ratio
- Autism rates higher in northern latitude
Autism Prevention
Vitamin D levels and supplementation

• Optimal level for 25-OH vitamin D 50 to 80 ng/mL, contrasted with levels sufficient to prevent rickets (> 20 ng/mL) → Michael Holick – see http://drholick.com The Vitamin D Solution

• Prevalence of vitamin D deficiency relative to optimal levels much higher than recognized ~ 80% or higher among obese and dark skinned

• VDR single nucleotide polymorphism affects dose needed to boost levels – dose needed may be 5,000 to 10,000 units daily, especially among pregnant women

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Concluding Comments

• ASD is potentially preventable.
• ASD is treatable – and functional recovery is possible for some. Improvement is possible for many.
• Anyone who claims he/she knows what causes – or that X does not cause - autism is either uninformed and naïve.
• Everyone in this room is a HERO!