Communicating Autism Science with Vaccine-Hesitant Families

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Welcome to Autism 101
Autism Spectrum Disorders

• Impairment in 3 domains
  – Social
    • interest in people
    • joint attention
    • imaginative play
  – Communication
  – Behavior (repetitive behaviors, tantrums, aggression)
What is autism?

- Social
- Language
- Behavior

These elements are interconnected in individuals with autism.
What is autism?

- Social Anxiety
- Asperger’s Syndrome
- ADHD Symptoms
- Depression
- Sleep Disturbances
- Anxiety
- Severe Functional Impairment
- Cognitive Impairment
- Compulsive & Repetitive Behavior
- Self-injurious Behavior
- Epilepsy
- Aggression
- Sensory Integration Difficulties

Eric London, 2009
What do we know?

• 1 in 68 children diagnosed with an autism spectrum disorder (CDC, 2014)

• Early Intervention Works!

• Autism is a genetically based disorder.

• Gene/Environment Interaction
What have we learned about cause?

• 25-40% of autism attributable to specific genetic causes
  – Genes identified involved in brain formation during second trimester

• Brain Imaging Studies and Genetics converging on neural synapses
  – “Synaptopathy”
  – Formation and Function of Synapses

Buxbaum, 2013
State, 2012, 2014
Synapse
What have we learned about cause?

• Genetic Discoveries Lead to Novel Therapeutics
  – Animal Models of Autism
  – Clinical Trials in Humans for Fragile X, Phelan McDermid Syndrome

• Heritability vs De Novo mutation (older fathers, older mothers increase risk; germ line mutations)
Copy Number Variation
Copy Number Variation
What do we know about cause?

• Environmental Factors Converge on 2\textsuperscript{nd} Trimester
  – Valproic Acid taken during pregnancy
  – Rubella exposure during pregnancy
  – Flu exposure (wild, not vaccine)
  – Fertility drugs?
  – Air pollution?
  – Anti-depressants taken during pregnancy?
  – Pet Shampoo?
  – Ultrasound has been ruled out
What do we know about cause?

–Tissue Studies: Converge on 2\textsuperscript{nd} Trimester
  • Post Mortem tissue studies show disorganized patches of brain cells in the cortex

Courchesne, 2014
What do we know about cause

• Differences in brain structure seen in 2nd trimester fetus

• Genes associated with autism involved in brain development in 2nd trimester

• Environmental exposures of concern converge on 2nd trimester

What do we know about diagnosis

- Reliable lab diagnosis at 6 weeks
- Measureable biomarkers at 9 months

Jones & Klin, 2014
What have we learned about treatment?

• Applied Behavior Analysis Therapy
  – Early Start Denver Model (increases IQ)
  – New models for 9 months old, 6 months old, 3 months old?
• Speech Therapy
• Occupational Therapy
• Physical Therapy
• Social Skills Training
• FDA approved pharmacological interventions (Risperdal, Abilify)
• Ongoing FDA trial; IGF1 and Oxytocin
Other Treatments (Non Evidence based)

- Music Therapy (AIT)
- Horseback Riding
- Dolphin Therapy
- Special Diet (Gluten/Casein Free)
- Vitamin Supplements
- Secretin Injections
- Prism Glasses
- Anti-fungal agents
- Bleach enema

- Canine Therapy
- Chelation
- Giant Electromagnets
- Raw camel milk (must be unpasteurized!)
- Hyperbaric Oxygen
- Holding Therapy
- Nicotine Patch
- Marijuana (for child, not parent?)
- Snake Oil (yes, actual snake oil)
Why do Parents Swear by these treatments?

- Placebo Response = Oxytocin response? (theory, not data)
CASE MODEL:

• **Corroborate**: Acknowledge the parents’ concern and find some point on which you can agree. This sets the right tone.

• **About Me**: Describe what you have done to build your knowledge base and expertise.

• **Science**: Describe what the science says.

• **Explain/Advise**: Give advice to patient, based on the science.
CASE MODEL:

• **C**orroborate: Acknowledge the parents’ concern and find some point on which you can agree. This sets the right tone

• **A**bout Me: Describe what you have done to build your knowledge base and expertise

• **S**cience: Describe what the science says

• **E**xplain/Advise: Give advice to patient, based on the science
CASE Science Summary

• Over 2000 scientists from over 35 countries met in May in Atlanta for the International Meeting for Autism Research

• Genetic Studies, Environmental Studies, Post Mortem Tissue Studies all point to 2nd trimester

• Autism can be reliably diagnosed at 9 months of age, before MMR is administered
Autism Science Foundation’s Mission

• Support autism research by providing funding and other support to scientists and organizations conducting, facilitating, publicizing and disseminating high quality autism research.

• Support families by reinforcing message that no science (over two dozen studies) indicates a causal link between autism and vaccines

• Founded by parents and scientists, working together
• Web  www.autismsciencefoundation.org

• Blog  www.autismsciencefoundation.wordpress.com

• Facebook  Autism Science Foundation

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• YouTube  AutismScienceFdn

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Thank you!!