



Communicating Autism Science with Vaccine-Hesitant Families

Alison Singer
President, Autism Science Foundation

National Conference on Immunization and Health Coalitions
Seattle, WA
May 23, 2014



Welcome to Autism 101





Autism Spectrum Disorders

- Impairment in 3 domains

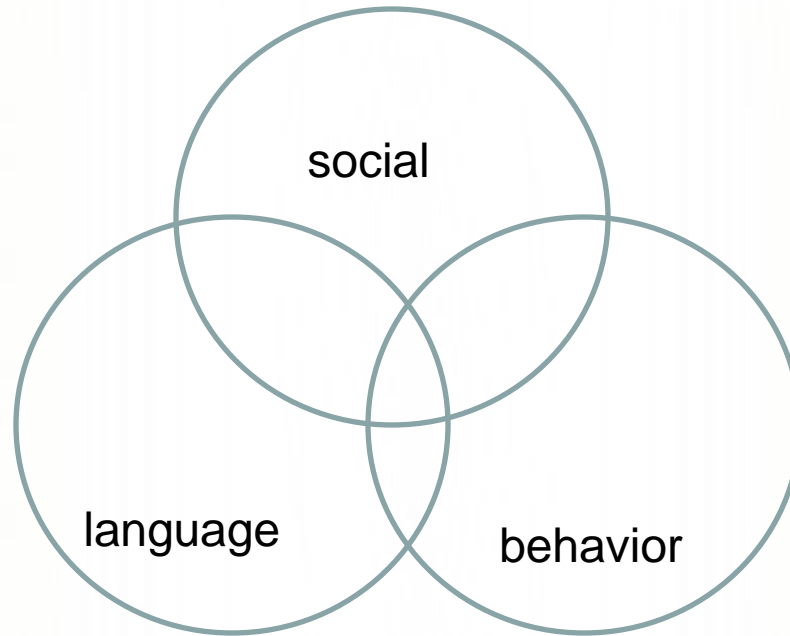
- Social

- interest in people
 - joint attention
 - imaginative play

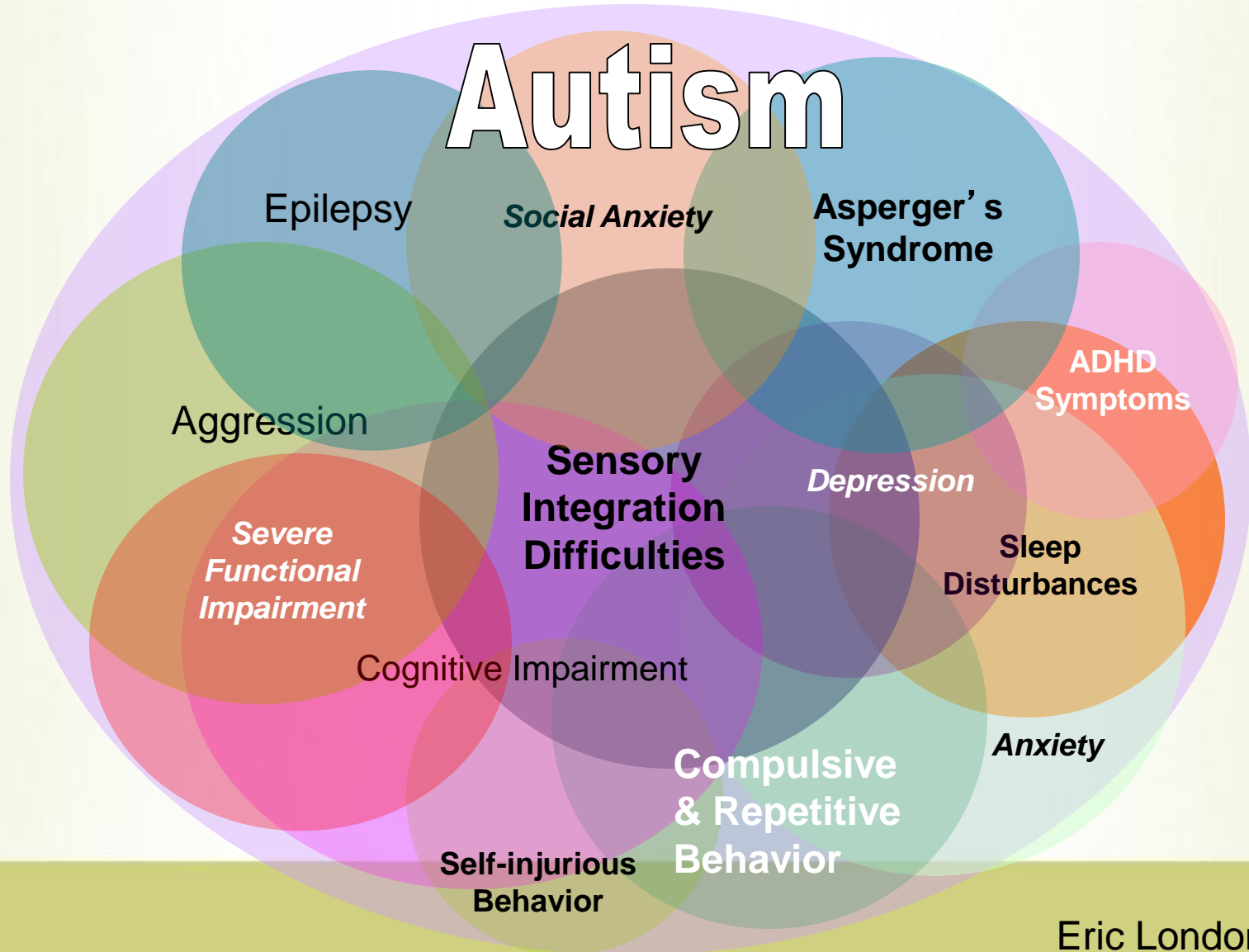
- Communication

- Behavior (repetitive behaviors, tantrums, aggression)

What is autism?



What is autism?



Eric London, 2009



What do we know?

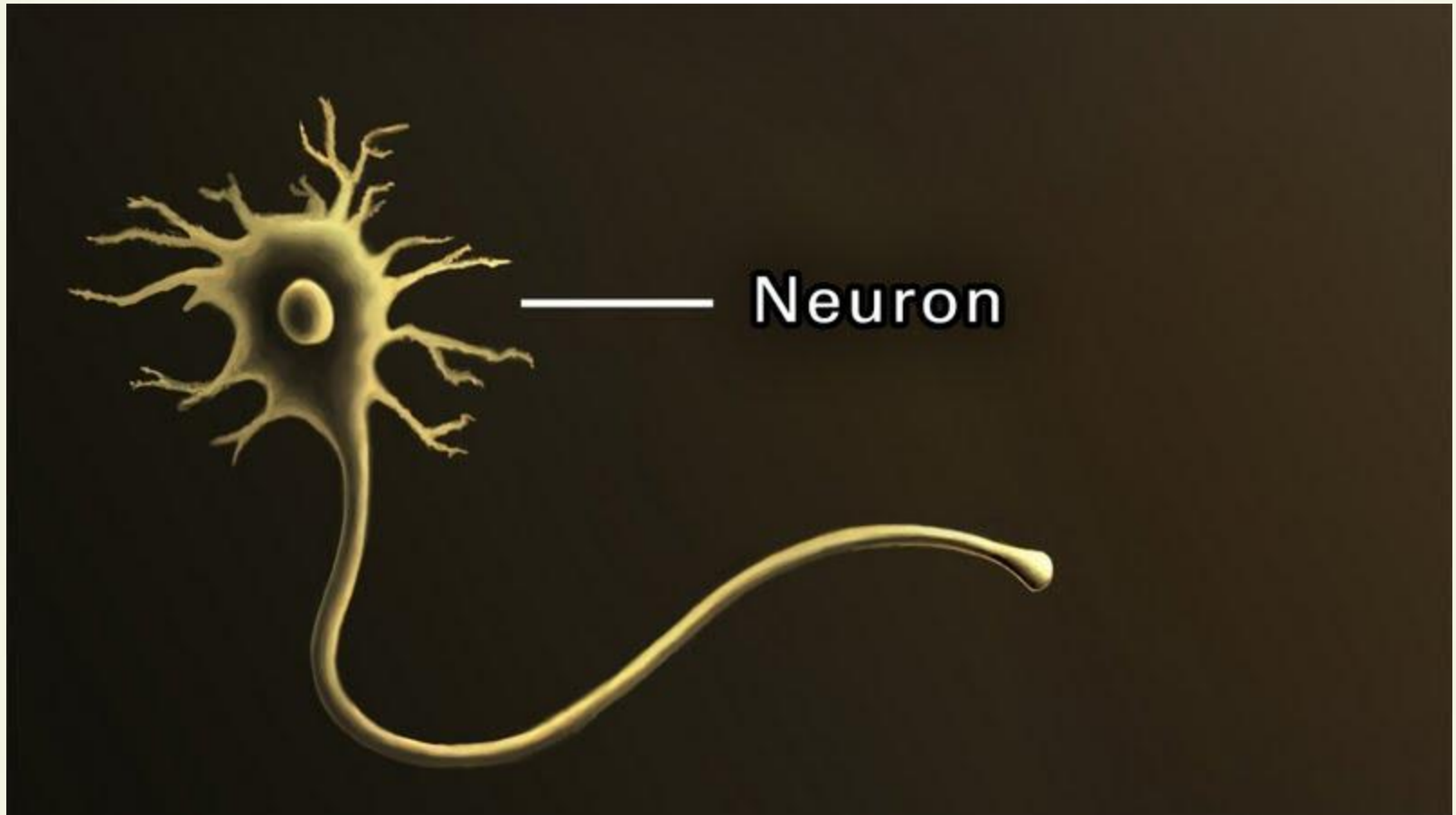
- 1 in 68 children diagnosed with an autism spectrum disorder (CDC, 2014)
- Early Intervention Works!
- Autism is a genetically based disorder.
- Gene/Environment Interaction

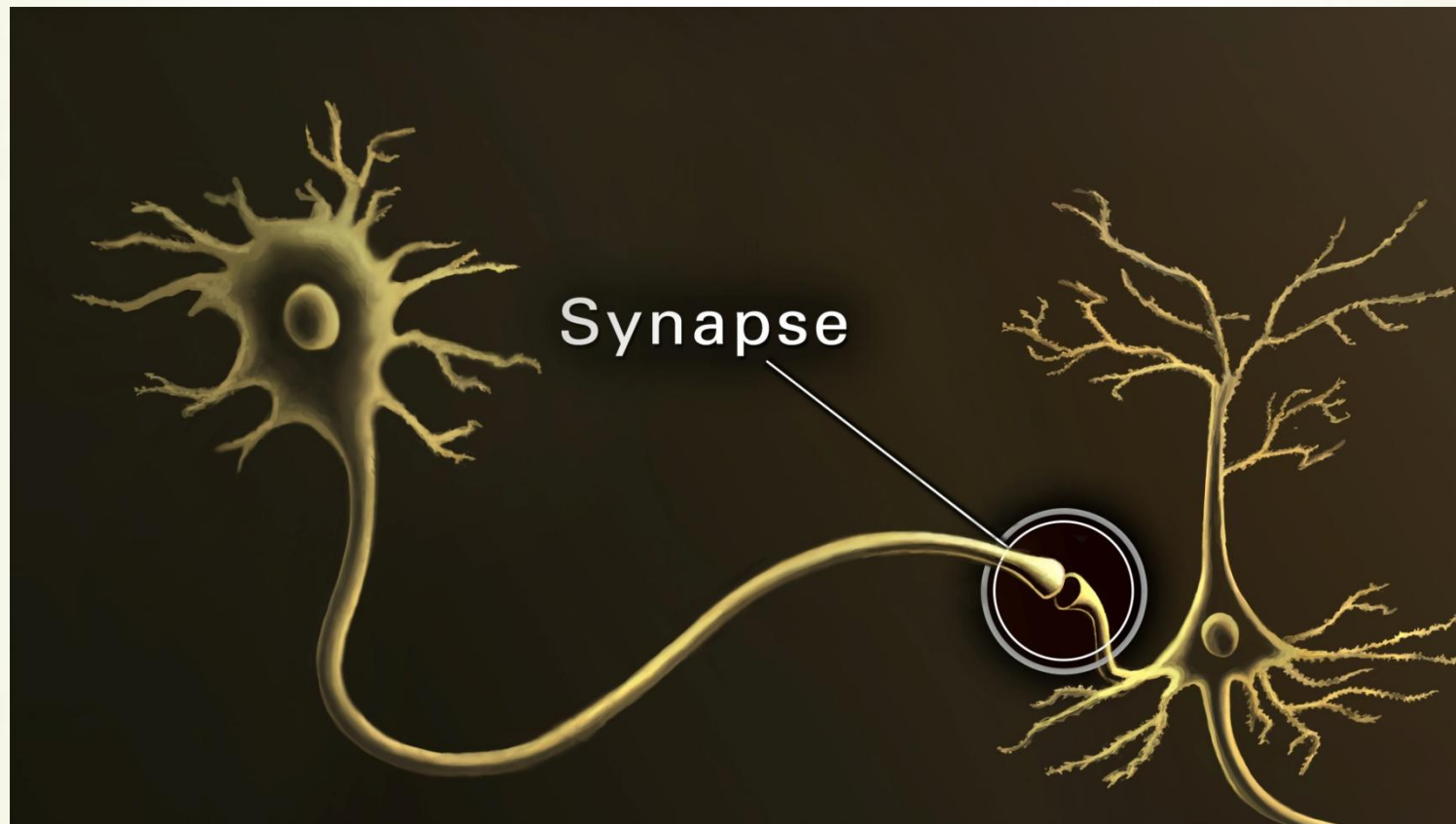


What have we learned about cause?

- 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



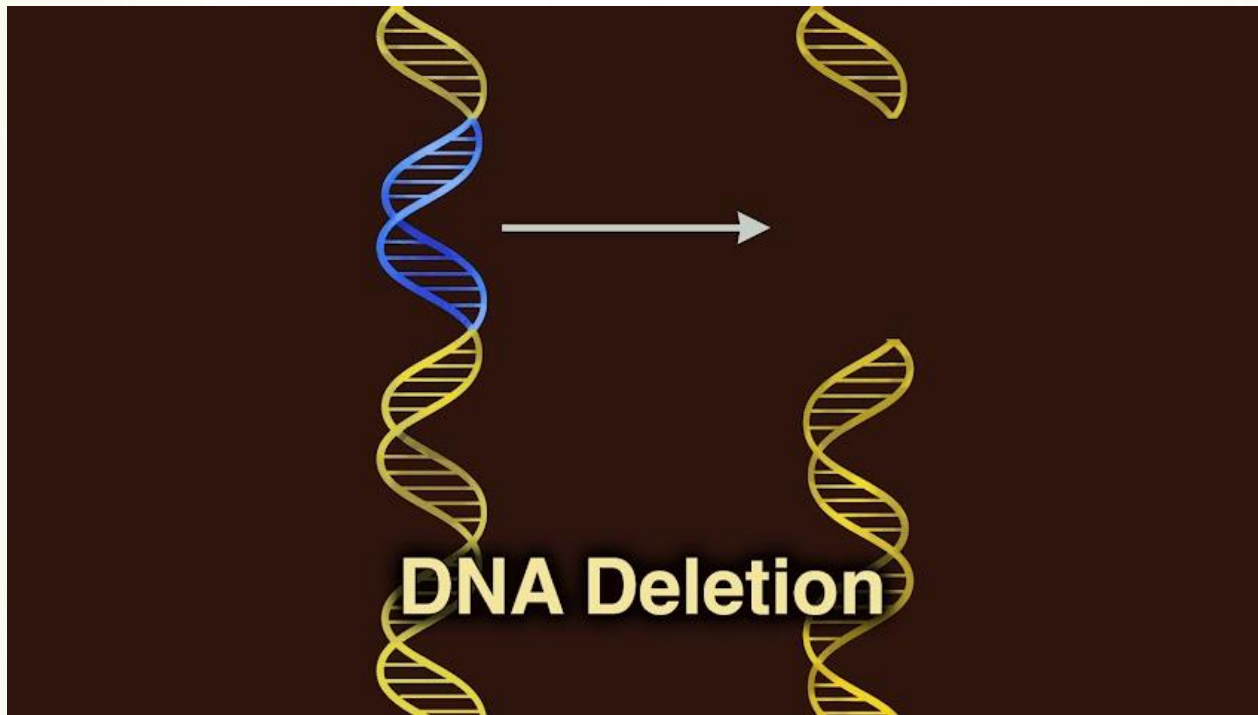




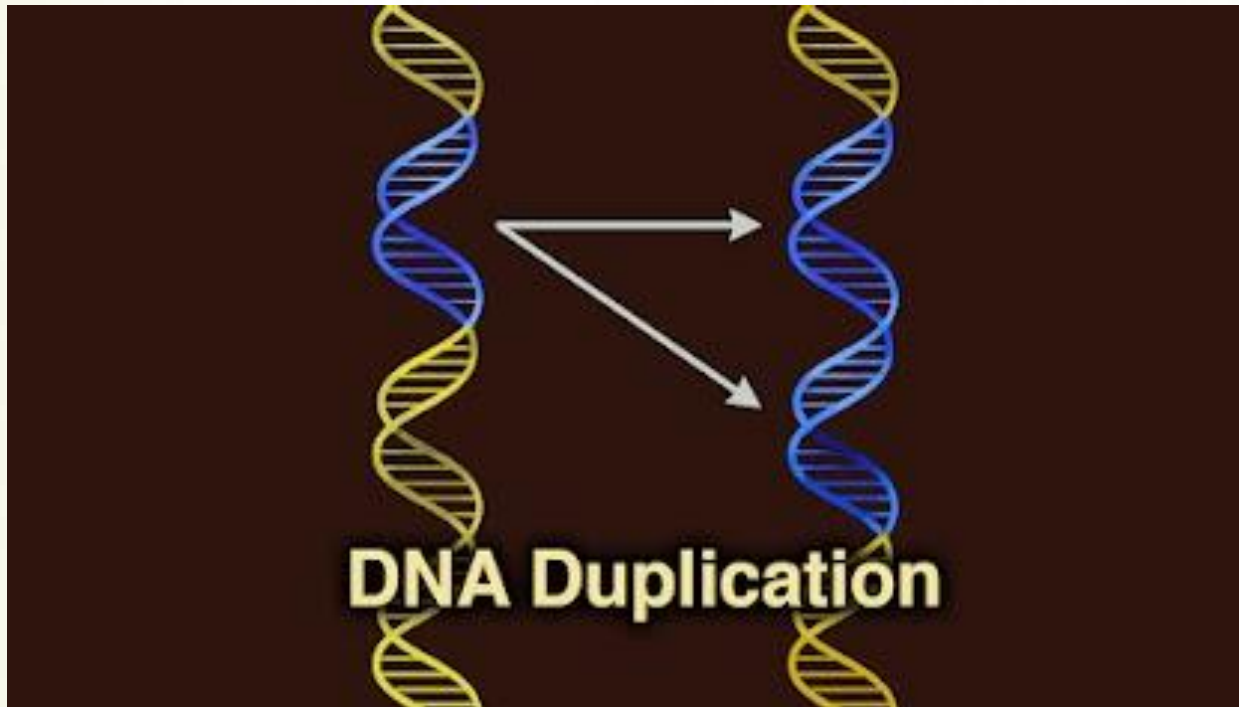
What have we learned about cause?

- 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 2nd 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 2nd 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

¹. Courchesne, 2011, 2013, 2014



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:

- **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 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
- **Twitter** @AutismScienceFd
- **YouTube** AutismScienceFdn
- asinger@autismsciencefoundation.org



AUTISM SCIENCE FOUNDATION

SEARCHING
SOLVING
SHARING

Thank you!!