



# *Communicating Autism Science with Vaccine-Hesitant Families*

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IZ Coalitions Network  
Immunization Action Coalition (IAC) Webinar  
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# Welcome to Autism 101





## Autism Spectrum Disorders

- Impairment in 3 domains

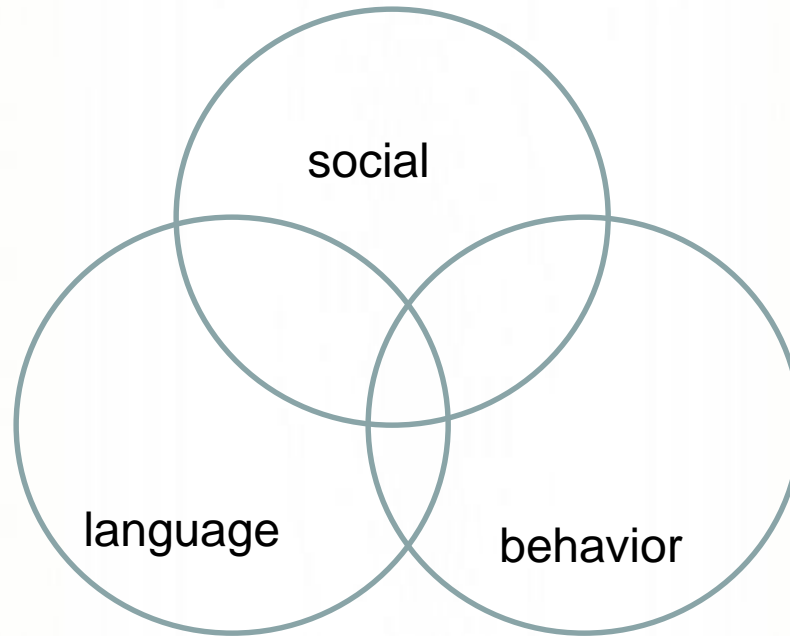
- Social

- interest in people
    - joint attention
    - imaginative play

- Communication

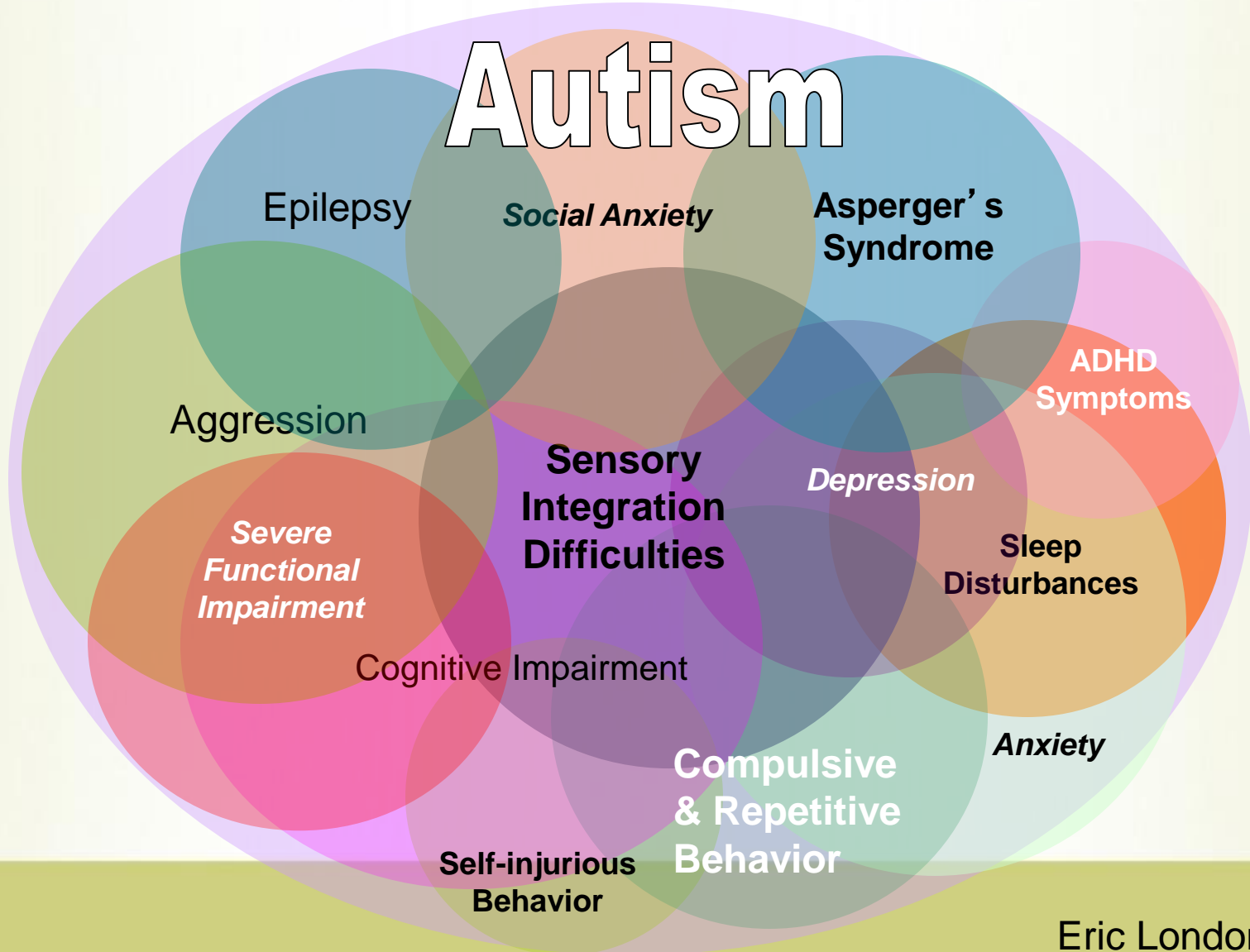
- Behavior (repetitive behaviors, tantrums, aggression)

## What is autism?



# What is autism?

# Autism



Eric London, 2009



## What do we know?

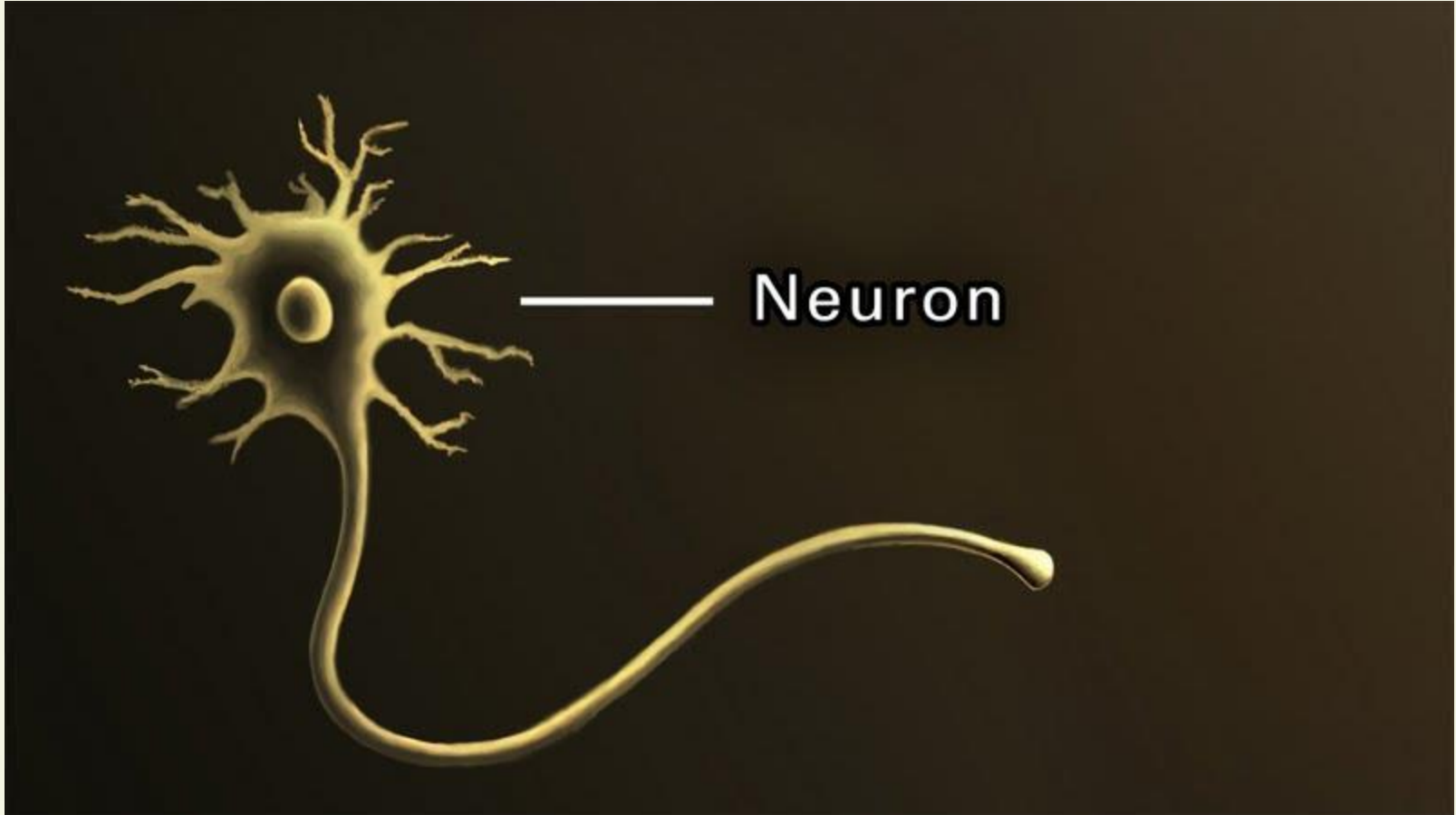
- 1 in 68 children diagnosed with an autism spectrum disorder (CDC, 2014)
- Early Intervention Works!
- Autism is a genetically based disorder.
- Gene/Environment Interaction



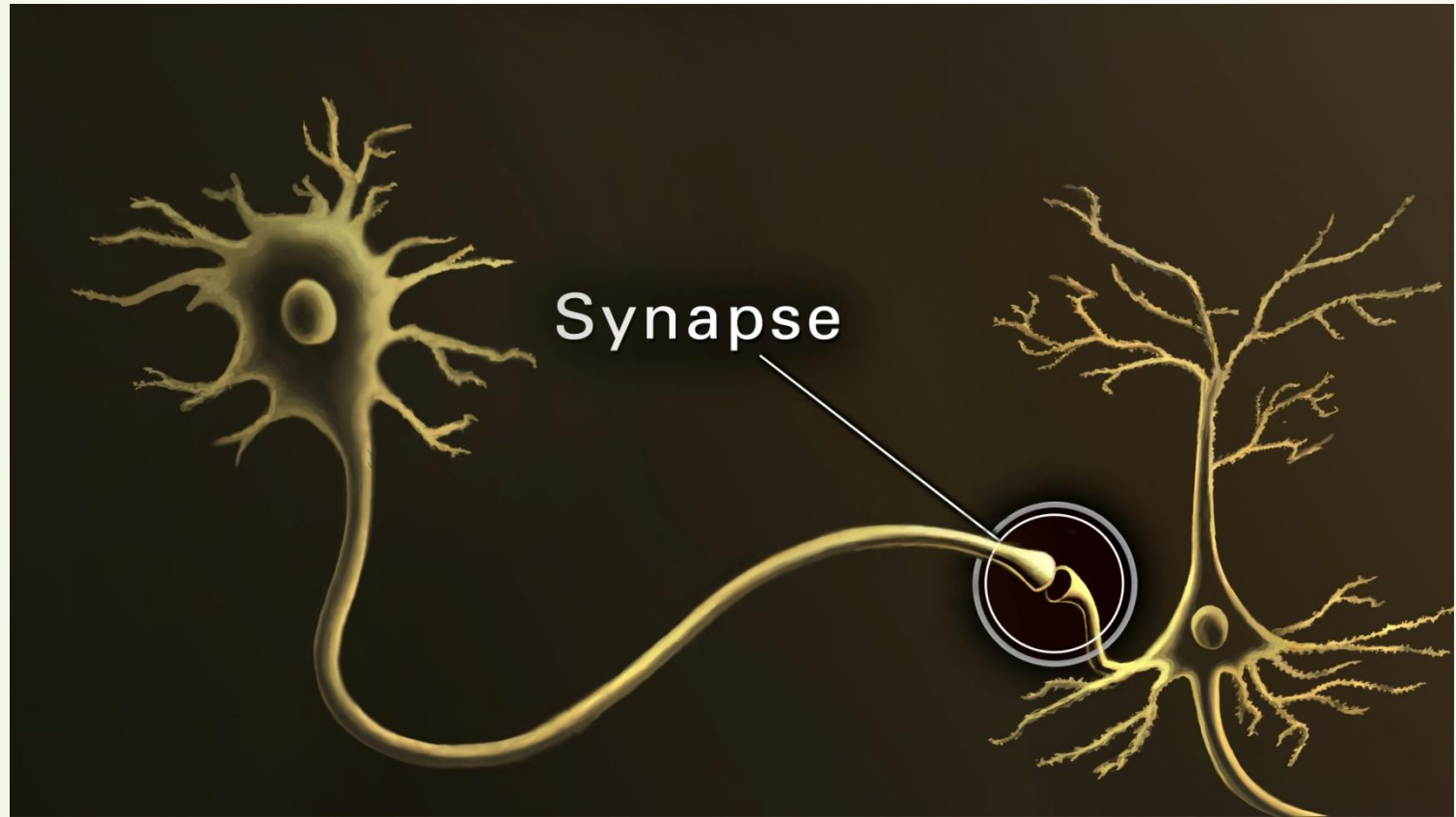
## What have we learned about cause?

- 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





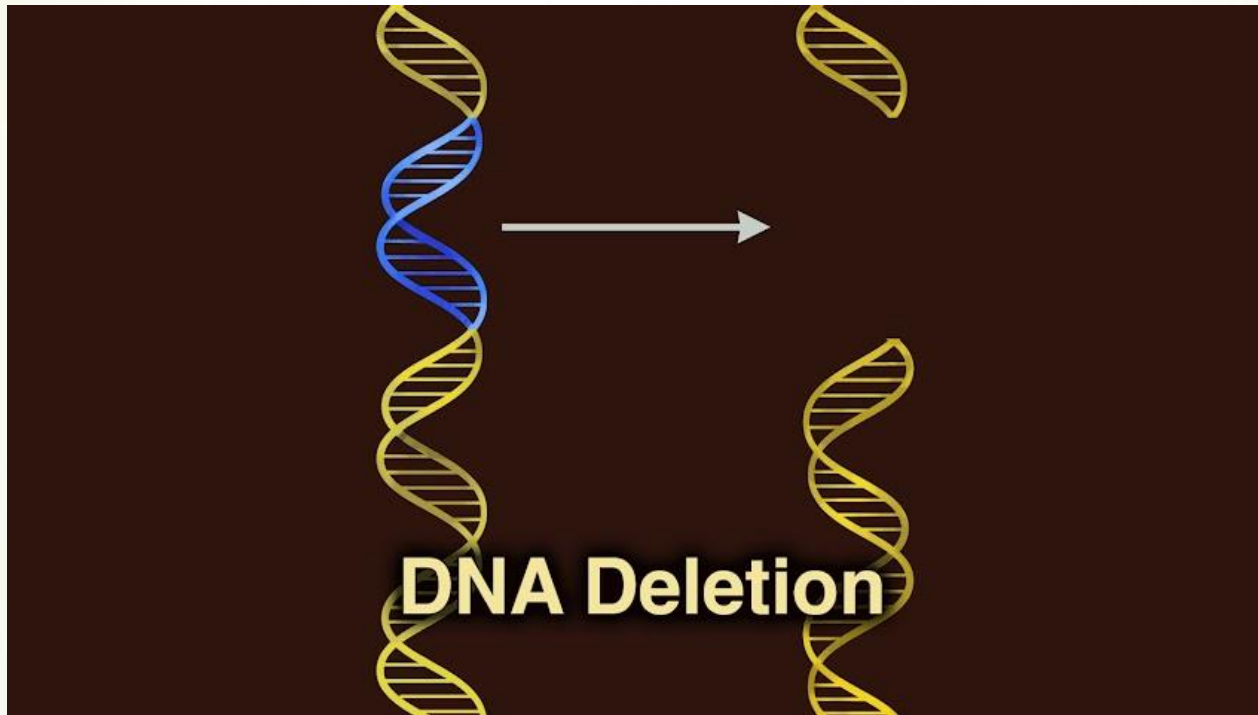




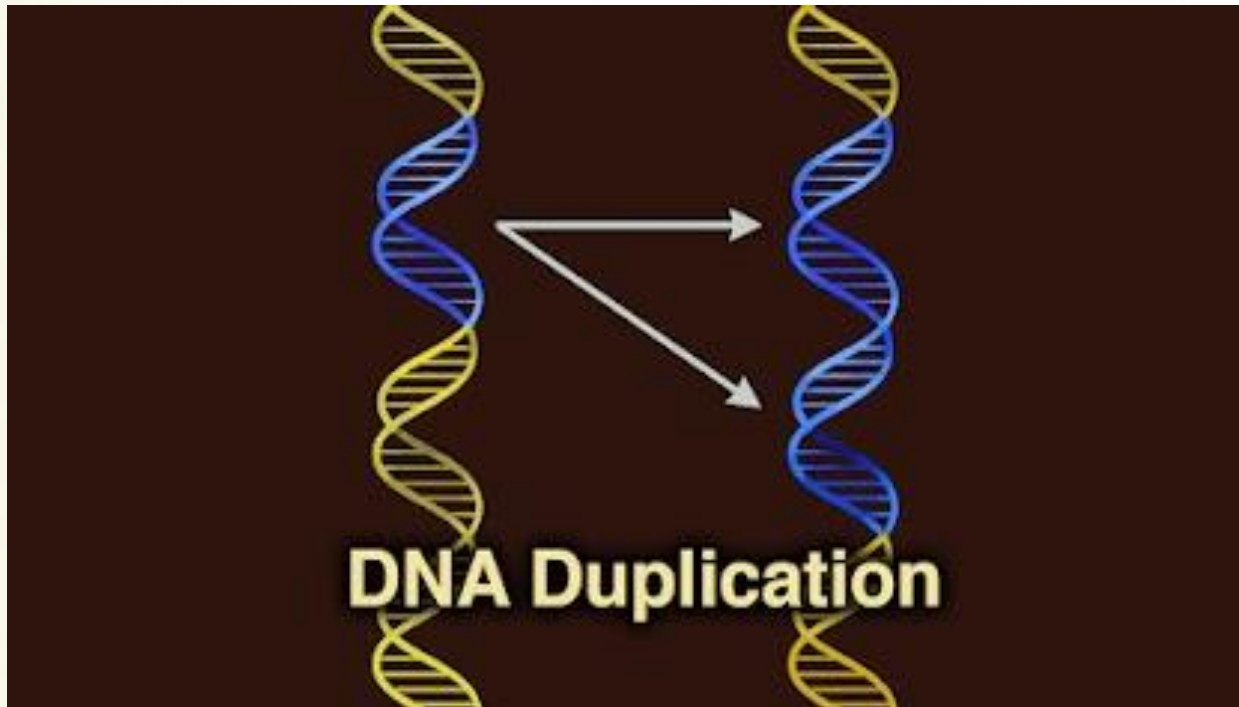
## What have we learned about cause?

- 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 2<sup>nd</sup> 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<sup>nd</sup> 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 2<sup>nd</sup> trimester fetus
- Genes associated with autism involved in brain development in 2nd trimester
- Environmental exposures of concern converge on 2nd trimester

<sup>1</sup>. 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



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## 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 2<sup>nd</sup> 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



# AUTISM SCIENCE FOUNDATION

SEARCHING  
SOLVING  
SHARING

- **Web** [www.autismsciencefoundation.org](http://www.autismsciencefoundation.org)
- **Blog** [www.autismsciencefoundation.wordpress.com](http://www.autismsciencefoundation.wordpress.com)
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**AUTISM** SCIENCE FOUNDATION

SEARCHING  
SOLVING  
SHARING

Thank you!!