


WHAT'S UP WITH AUTISM

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LEARNING AND BEHAVIORAL CLINIC
FONTANA PEDIATRICS

Moving forward with hope and optimism. ASD

**EDWARD CURRY M.D.
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- I do not have any Financial Disclosures
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LEARNING OBJECTIVES

- Identification and diagnosis child with Autism Spectrum Disorder
- Interpreting Q-CHAT Questionnaire
- Summarizing Therapy and Treatment

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CASE DISCUSSION

- 33 Month old who says only 2 to 3 words. Child has occasional temper tantrums. Father had speech and language delay until 4 year old.
- What other information do you need ?
- What are normal developmental milestones at 24 month ?

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What is Autism?

Autism Spectrum Disorders

Autism
 Asperger's Syndrome PDD-NOS CDD Rett's Syndrome

Social Interaction
 Communications
 Restricted, Repetitive, Stereotyped behaviors

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(A) **DSM IV:**
Pervasive Developmental Disorders:
Autism

(B) **DSM5:**
Autism Spectrum Disorders

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What are Social Interactions?

The "age appropriate" ability to:

- Communicate without words
- Interact or play with others
- Eye Contact
- Share enjoyment (joint attention)
- Respond to others feelings or emotions (social/emotional reciprocity)

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What is Language Development?

The "age appropriate" ability to:

- Understand and use words
- Initiate and sustain conversation
- Use language
- Make believe play

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What are concerning Behaviors?

- Restricted patterns of interests
- Rigidity or inflexibility
- Repetitive mannerism
- Persistent preoccupation to details

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RED FLAGS BY AGE

- 6 months no big smiles or other warm joyful expressions
- 9 months no back and forth sharing of sounds smiles are other facial expressions
- 12 month no babbling no back and forth gestures search is pointing showing reaching
- 16 months no words
- 24 months no meaningful two word phrases
- Any loss of speech babbling or social skills at any age

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RED FLAGS 12 – 30 MONTHS

- Infrequent or delayed response my name is called
- Inattentive to others pointing or eye direction cues
- Shows little interest in other children
- Infrequent attempts to point out or show objects of interest
- Rarely smiles to show or share enjoyment
- Limited variety of play with toys
- Poor coordination of eye contact with speech sounds/gesture
- Limited variety of speech sounds when trying to communicate

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Q-CHAT-10 Quantitative Checklist for Autism in Toddlers

A quick referral guide for parents to complete about their toddler (18 – 24 months) with concerns about autism.

For each item, please circle the response which best applies to your child:

	A	B	C	D	E
1 Does your child look at you when you call his/her name?	Always	Usually	Sometimes	Rarely	Never
2 How easy is it for you to get eye contact with your child?	Very easy	Quite easy	Quite difficult	Very difficult	Impossible
3 Does your child point to indicate that s/he wants something? (e.g. a toy that is out of reach)	Many times a day	A few times a day	A few times a week	Less than once a week	Never
4 Does your child point to share interest with you? (e.g. pointing at an interesting sight)	Many times a day	A few times a day	A few times a week	Less than once a week	Never
5 Does your child pretend? (e.g. care for dolls, talk on a toy phone)	Many times a day	A few times a day	A few times a week	Less than once a week	Never
6 Does your child follow where you're looking?	Many times a day	A few times a day	A few times a week	Less than once a week	Never
7 If you or someone else in the family is visibly upset, does your child show signs of wanting to comfort them? (e.g. stroking hair, hugging them)	Always	Usually	Sometimes	Rarely	Never
8 Would you describe your child's first words as:	Very typical	Quite typical	Slightly unusual	Very unusual	My child doesn't speak
9 Does your child use simple gestures? (e.g. wave goodbye)	Many times a day	A few times a day	A few times a week	Less than once a week	Never
10 Does your child stare at nothing with no apparent purpose?	Many times a day	A few times a day	A few times a week	Less than once a week	Never

SCORING: For questions 1-9, if you circle an answer in columns C, D or E, score 1 point per question. For question 10, if you circle an answer in columns A, B or C, score 1 point. Add points together for all ten questions. If your child scores more than 3 out of 10, the health professional may consider referring your child for a multi-disciplinary assessment.

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DSM 5 Criteria

A. Persistent deficits in social communication and social interaction across contexts, not accounted for by general developmental delays, and manifest by all 3 of the following, currently or by history:

Observed	History	None	
			Deficits in social-emotional reciprocity , ranging from abnormal social approach and failure of normal back and forth conversation through reduced sharing of interests, emotions, and affect and response to total lack of initiation of social interaction
			Deficits in nonverbal communicative behaviors used for social interaction; ranging from poorly integrated- verbal and nonverbal communication, through abnormalities in eye contact and body-language, or deficits in understanding and use of nonverbal communication, to total lack of facial expression or gestures
			Deficits in developing and maintaining relationships , appropriate to developmental level (beyond those with caregivers); ranging from difficulties adjusting behavior to suit different social contexts through difficulties in sharing imaginative play and in making friends to an apparent absence of interest in people

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DSM 5 Criteria

B. Restricted, repetitive patterns of behavior, interests, or activities as manifested by at least two of the following:

Observed	History	None	
			Stereotyped or repetitive speech, motor movements, or use of objects ; (such as simple motor stereotypies, echolalia, repetitive use of objects, or idiosyncratic phrases)
			Excessive adherence to routines, ritualized patterns of verbal or nonverbal behavior, or excessive resistance to change ; (such as motoric rituals, insistence on same route or food, repetitive questioning or extreme distress at small changes)
			Highly restricted, fixated interests that are abnormal in intensity or focus ; (such as strong attachment to or preoccupation with unusual objects, excessively circumscribed or perseverative interests)
			Hyper- or hypo-reactivity to sensory input or unusual interest in sensory aspects of environment ; (such as apparent indifference to pain/heat/cold, adverse response to specific sounds or textures, excessive smelling or touching of objects, fascination with lights or spinning objects)

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DSM 5 Criteria: Autism

C. Symptoms must be present in the early developmental period (but may not become fully manifest until social demands exceed limited capacities, or may be masked by learned strategies later in life)

D. Symptoms cause clinically significant impairment in social, occupational, or other important areas of functioning.

E. These disturbances are not better explained by intellectual disability (intellectual developmental disorder) or global developmental delay. Intellectual disability and autism spectrum disorder frequently co-occur; to make comorbid diagnoses of autism spectrum disorder and intellectual disability, social communication should be below that expected for general developmental level.

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DSM 5 SUPPLEMENTAL INFORMATION
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Severity Level (Social Communication)

■ **Level 1:** Requiring Support. Without supports in place, deficits in social communication cause noticeable impairments. Difficulty initiating social interactions, and clear examples of atypical or unsuccessful responses to social overtures of others. May appear to have decreased interest in social interactions.
For example, a person who is able to speak in full sentences and engages in communication but whose to-and-fro conversations with others fails, and whose attempts to make friends are odd and typically unsuccessful.

■ **Level 2:** Marked deficits in verbal and nonverbal social communication skills; social impairments apparent even with supports in place; limited initiation of social interactions and reduced or abnormal response to social overtures from others.
For example, a person who speaks in simple sentences, whose interaction is limited to narrow special interests, and who has markedly odd nonverbal communication.

■ **Level 3:** Severe deficits in verbal and nonverbal social communication skills cause severe impairments in functioning; very limited initiation of social interactions and minimal response to social overtures from others.
For example, a person with few words of intelligible speech who rarely initiates interactions and, when he or she does, makes unusual approaches to meet needs only and responds to only very direct social approaches.

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Severity Level (Restricted, repetitive behaviors)

■ **Level 1:** Inflexibility of behavior cause significant interference with functioning in one or more contexts. Difficulty switching between activities. Problems of organization and planning hamper independence.

■ **Level 2:** Inflexibility of behavior, difficulty coping with change, or other restricted/repetitive behaviors appear frequently enough to be obvious to the casual observer and interfere with functioning in a variety of contexts. Distress and/or difficulty changing focus or action.

■ **Level 3:** : Inflexibility of behavior, extreme difficulty coping with change, or other restricted/repetitive behaviors markedly interfere with functioning in all spheres. Great distress/difficulty changing focus or action.

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COMMON MYTHS ABOUT ASD CHILD WITH AUTISM

- NEVER MAKE EYE CONTACT
- DOES NOT COMMUNICATE
- IS NOT AFFECTIONATE
- DOES NOT FORM ATTACHMENTS
- ALL CHILDREN WITH REPETITIVE BEHAVIORS HAVE AUTISM
- ALL CHILDREN WITH POOR SOCIAL SKILLS HAVE AUTISM
- ENGAGES IN SELF-STIMULATORY AND REPETITIVE BEHAVIORS ALL THE TIME

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Growing Prevalence of ASD According to CDC

Identified Prevalence of Autism Spectrum Disorder

ADDM Network: 2000-2010
Combining Data from All Sites

Surveillance Year	Birth Year	Number of ADDM Sites Reporting	Prevalence per 1,000 Children (range)	This is about 1 in X children...
2000	1992	6	6.7 (4.7-10.6)	1 in 150
2002	1994	14	6.6 (4.7-10.6)	1 in 150
2004	1996	8	8.0 (4.7-14.6)	1 in 125
2006	1998	11	9.0 (4.7-16.2)	1 in 110
2008	2000	14	11.3 (4.7-24.2)	1 in 88
2010	2002	11	14.7 (4.7-33.2)	1 in 68

Prevalence per 1000 children

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Growing prevalence – Why?


- Autism as a spectrum & a better definition of autism
 - Decrease in diagnosis of mental retardation
- More experienced clinicians
- 1987 Federal law (IDEA)
- 1991 Autism added as a special education category
- 1990 Federal law made institutionalization illegal

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Growing Prevalence – Why?


- In 1990,
 - Federal law made institutionalization illegal
 - ASD added as a special education category
- Changing diagnostic criteria for ASD
- More experienced clinicians
- Community knowledge & media attention

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Growing prevalence – Why?


- ADDITIONAL SERVICE ARE PROVIDED
 - SPECIAL EDUCATION (SDC)
 - BEHAVIORAL THERAPY
 - SPEECH THERAPY
 - OCCUPATIONAL THERAPY
- ALL OF THESE SERVICE ARE PROVIDED BY MEDICAL INSURANCE
 - EXCEPT SDC

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Etiology of ASD


- Exact etiology is unknown
 - May involve multiple genes
 - Environmental factors play a role

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Genetic Basis of ASD


- Highly heritable
 - 60% concordance for identical twins and 1-3% for fraternal twin
 - Recurrence risk 5-6% for siblings
- <10% are associated with a known syndrome
 - Fragile X, Tuberous Sclerosis, Down's, etc.

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Possible Co-existing Conditions

- Mental health problems
 - Anxiety disorder & depression
- ADHD
- Intellectual disability
- Learning disabilities
- Sensory processing issues
 - Seizures
 - Gastrointestinal complaints & feeding issues
 - Sleep problems

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Treatment / Services

- Behavioral Interventions
 - Applied Behavior Analysis
 - KP now provides
 - Floor Time
 - Social Skills Training
- Medical Management
 - Psychopharmacology
- Ancillary Services
 - Speech Therapy
 - Occupational Therapy

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Treatment Plan for ASD

- Complex since each child has different strengths and deficits
- Should take a multi-modal, holistic approach
- Involves healthcare treatment combined with services/support provided by:
 - Regional Centers
 - Schools
 - Parents/Caregivers

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Newsweek

Babies And Autism

Why New Research On Infants May Hold The Key to Better Treatment

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KP RESEARCH: GESTATIONAL DIABETES AND AUTISM
Media Sensation

THE JAMA ARTICLE

Association of Maternal Diabetes With Autism in Offspring

Anny H. Xiang, PhD; Xinhui Wang, MS; Mayra P. Martinez, MPH; Johanna C. Walthall, PhD; Edward S. Curry, MD; Kathleen Page, MD; Thomas A. Buchanan, MD; Karen J. Coleman, PhD; Darios Getahun, MD, PhD

Includes: CME, Supplemental Content, Author Interview, Author Video Interviews, JAMA Report Video

JAMA April 14, 2015, Vol 313, No. 14

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USNews HEALTH

HEALTHY JEEP RENEGADE PHOTOBOMB LIFE

Autism Linked to Gestational Diabetes, Study Suggests

Researchers urge women to get early prenatal care.

Researchers suggest there could be a link between gestational diabetes and autism.

By LINDSEY TANNER, AP Medical Writer for U.S. News & World Report CHICAGO (AP) — Diabetes that develops early in pregnancy may increase women's chances of having a child with autism, according to a new study.

The risk was seen in young children whose mothers were diagnosed with diabetes during the most crucial period of fetal brain development. Reasons for the potential link are uncertain but it's possible that exposure to high levels of blood sugar from the mother disrupt fetal brain growth, especially in brain regions important for communication and social behavior, said study co-author Dr. Edward Curry, a learning and behavior specialist for Kaiser Permanente in Fontana, California.

Here are five things to know about diabetes in pregnancy, autism and the study, published in Tuesday's Journal of the American Medical Association.

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Gestational diabetes increases autism risk

Lin Skala, USA TODAY 3:18 p.m. EDT April 14, 2015

Children are slightly more likely to develop autism if their mothers were diagnosed with diabetes early in pregnancy, a new study shows.

Women newly diagnosed with diabetes by the 26th week of pregnancy were 42% more likely to have a child diagnosed with autism, according to the study of more than 322,000 children born between 1995 and 2009.

Overall, about 1% of all children in the study were diagnosed with autism by a median age of age 5½. Having gestational diabetes, the kind diagnosed during pregnancy, increased the chance of having a child with autism to 1.4%.

Researchers found no increase in autism risk if mothers were diagnosed with diabetes after 26 weeks of pregnancy. A typical pregnancy lasts 40 weeks.

Authors also found no increased risk of autism if women had type 2 diabetes before becoming pregnant, possibly because these women already had their blood sugar under control, according to the study, published in the Journal of the American Medical Association.

Diabetes interferes with the body's ability to move the sugar provided by food into cells. That can lead the levels of sugar in the blood to rise to unhealthy levels, damaging blood vessels.

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MEDIA SENSATION NUMBER ONE NEWS STORY FOR APRIL 14

Health

Diabetes During Pregnancy Could Be Linked to Autism, Study Finds

Findings (CHICAGO) — Diabetes that develops early in pregnancy may increase women's chances of having a child with autism, according to a new study.

is Gestational Diabetes Linked to Autism? U.S. News & World Report

Gestational diabetes increases autism risk. USA TODAY

Diabetes mellitus

Scientists are working on a breath test to diagnose stomach cancer

To Protect Your Aging Brain, Start With Exercise

What's fueling drug sales? Obamacare and expensive meds

THE NEWS STORIES

- USA Today:
<http://www.usatoday.com/story/news/2015/04/14/gestational-diabetes-autism-risk/2558426/>
- Reuters:
<http://www.reuters.com/article/2015/04/14/us-pregnancy-diabetes-autism-idUSKBN0NS22P20150414>
- US News and World Report (via Associated Press):
<http://health.usnews.com/health-news/news/articles/2015/04/14/autism-could-be-linked-with-moms-diabetes-during-pregnancy>
- CBS News website (via Health Day):
<http://www.cbsnews.com/news/gestational-diabetes-in-pregnancy-may-raise-childs-risk-of-autism/>
- LiveScience:
<http://www.livescience.com/50476-gestational-diabetes-autism-children.html>
- Healthline:
<http://www.healthline.com/health-news/study-finds-potential-link-between-gestational-diabetes-and-autism-041415#1>
- NY Daily News:
<http://www.nydailynews.com/life-style/health/autism-linked-gestational-diabetes-study-article-1.2184913>
- CBS New York video link:
<http://newyork.cbslocal.com/video/11389009-dr-max-gomez-gestational-diabetes-and-autism/>

• WHY ALL THE MEDIA ATTENTION

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WHY ALL THE MEDIA ATTENTION TO THIS STUDY

- Hypothetical Causes of Autism with NO scientific basis
 - IMMUNIZATIONS IN GENERAL
 - MMR vaccine
 - Thimerosal in vaccine
- FINALLY SCIENTIFICALLY PROVEN ETIOLOGY
 - RELATED TO INCREASE RATE OF AUTISM SPECTRUM DISORDER

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UNPROVEN THERAPIES

- Gluten-free/Casein-free diet
- Antifungal/antiviral agents
- IV or oral immunoglobulin
- High dose vitamin therapies
- Secretin
- Chelation
- Hyperbaric oxygen
- Auditory integration training
- Biofeedback

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GESTATIONAL DIABETES AND AUTISM

- This study is about the relationship between exposure to mothers' diabetes status and timing of exposure during pregnancy and risk of autistic spectrum disorders in children.
 - We looked at electronic health records of 322,323 children who were born in Kaiser Permanente Southern California medical centers from 1995 to 2009.
- Children were tracked from birth using electronic health records until the first of the following: date of clinical diagnosis of autism spectrum disorders, last date of continuous KPSC health plan membership, death due to any cause, or December 31, 2012.
- The study was conducted to assess risk of autistic spectrum disorders associated with in utero exposure to pre-existing type 2 and gestational diabetes.

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What are the findings of this study?

- Children of mothers who had preexisting diabetes or gestational diabetes diagnosed by 26 weeks gestation
 - Approximately 60% greater risk of having autistic spectrum disorders than children of mothers who did not have diabetes during pregnancy.
- Children of mothers who had gestational diabetes diagnosed after 26 weeks gestation had
 - No greater risk for autism disorders than children of mothers who did not have diabetes during pregnancy
- After adjustment for differences in other risk factors, the autism risk associated with gestational diabetes diagnosed by 26 weeks gestation was approximately 40% and remained statistically significant.
 - After adjustment for risk factors Mothers with Type 2 Diabetes during pregnancy had No greater risk for autism disorders

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What is the Significance of this study?

Our findings indicate that early exposure to abnormal intrauterine environment may have important effects on long-term health in children.

We hope this study will help us learn more about the factors that may lead to autism and other developmental disabilities.

How type 2 and gestational diabetes may affect child development.

The results will also help us to address prevention and treatment.

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KEY MESSAGE FROM THIS STUDY

- **EARLY PRENATAL CARE IS IMPORTANT**
 - Pregnant Mothers need to start on Prenatal vitamins, folic acid and have a healthy diet.
 - Avoid Alcohol and Smoking
 - For patients, it is important to check and maintain normal blood sugar, especially during pregnancy planning and throughout pregnancy.
 - All of these factors are important for the health of our children.
- Screening for gestational diabetes early and control of sugar levels early and throughout pregnancy for pregnant women may be important in reducing autism risk for their children.
- For clinicians, screening for autistic disorders in children of women with gestational diabetes diagnosed by 26 weeks gestation may be warranted.

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THE JAMA ARTICLE

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Includes: CME, Supplemental Content, Author Interview, Author Video Interviews, JAMA Report Video

JAMA April 14, 2015, Vol 313, No. 14


THE VIDEO

<http://jama.jamanetwork.com/multimediaPlayer.aspx?mediaid=10099915>

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TAD's Story




Born 1987. Followed him since 1996.

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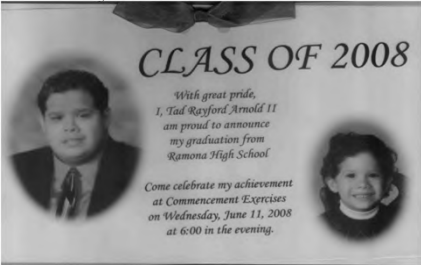
TAD's Story



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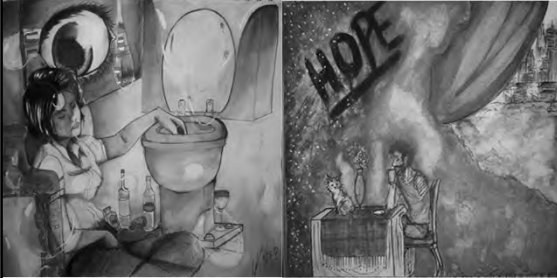
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TAD's Story



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HIGH FUNCTIONING ANGELA ARTWORK



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