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Inside News: 3 Let Baby Set the Delivery Date... 4 Obesity and Heart Disease... Probiotics... NIEHS Kids' Pages

Autism Spectrum Disorder Uncovering Clues to a Complicated Condition

Autism is a complex brain disorder that first appears during early childhood. It affects how a person behaves and interacts with others. People with autism might not look you in the eye when talking. They may spend a lot of time lining up toys or other objects. Or they may say the same sentence over and over.

The disorder is so variable—affecting each person in very different ways—that it can be difficult to diagnose and treat. This variability is why autism is called a “spectrum” disorder. It spans the spectrum from mild to severe and includes a wide range of symptoms.

NIH-funded scientists have been working to uncover the secrets of autism. They’ve identified **genes** that may boost the risk for autism. They’ve developed therapies that can help many of those affected. And they’ve found that starting treatment as early as possible can lead to better outcomes. Still, there’s much more we need to learn about this complicated condition.

About 1 in 88 children may have autism spectrum disorder, according to the U.S. Centers for Disease Control and Prevention. The number of affected children has been growing in recent years. Many researchers believe this increase is due to better

diagnosis and awareness. Others suspect that yet-unknown factors may be partly to blame.

Although the exact causes of autism are unclear, research suggests that both genes and the environment play important roles. Autism affects a child’s development in different ways, and so it’s known as a developmental disorder.

Parents are often the first to suspect that something may not be quite right with their child’s development. They may notice their baby doesn’t make eye contact, becomes overly focused on certain objects or isn’t “babbling” like other children the same age.

“A parent may first have concerns when a child is under 2 years of age,” says Dr. Connie Kasari, a child development expert at the University of California, Los Angeles. “A more certain diagnosis can usually be made by age 2, but some cases might not be clear until much later.”

There are no direct tests, like blood tests or brain scans, that can identify autism. Instead, the condition is diagnosed by looking at a child’s behaviors and development.

“All affected children have some sort of social impairment, but symptoms vary along a continuum,” Kasari says. “Impairment can range from kids who are in their ‘own world’ and seemingly unaware of others to high-functioning individuals who are just



awkward and seem to miss the point of social interactions.”

In May 2013, the American Psychiatric Association updated an important book that’s used to diagnose and classify mental disorders. The *DSM-5 (Diagnostic and Statistical Manual of Mental Disorders, 5th edition)* includes an updated definition for autism spectrum disorder. The condition is now identified by looking for 2 broad categories of symptoms: problems with social communication and the presence of “stereotyped” behaviors, such as walking in certain patterns or insisting on specific or unusual routines. To be diagnosed with autism, these symptoms must arise during

continued on page 2



Definitions

Genes

Stretches of DNA, a substance you inherit from your parents, that define characteristics such as how likely you are to get certain diseases.

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continued from page 1

early childhood, even if they're not noticed until later, when social demands increase.

"The new *DSM-5* definition moves all the disorders into a single spectrum, rather than the 4 separate autistic disorders described in the past," says NIH pediatrician and neuroscientist Dr. Susan Swedo. She chaired the expert panel that updated the *DSM-5* definition of autism spectrum



Wise Choices Signs of Autism

Children with autism may:

- have problems with normal back-and-forth conversation.
- lack interest in other children or have trouble sharing in imaginative play.
- avoid eye contact.
- miss social cues, such as facial expressions and gestures.
- repeat words or movements.
- excessively line up or flip over objects such as toys, or have an intense attachment to objects.
- insist on familiar routines.
- react strongly (or under-react) to the way things smell, taste, look, feel or sound.

CDC recommends that children be screened for developmental delays and disabilities during regular doctor visits at 9, 18, and 24 or 30 months, with screening for autism at 18 and 24 months.

disorders. "The new criteria are also more inclusive of minorities, adolescents and young adults with autism than the previous edition, which focused more on boys ages 4 to 9."

Getting diagnosed as early as possible is crucial. "Autism is treatable even though it's not curable," says Dr. David Mandell, an expert in autism and health services at the University of Pennsylvania. "If we intervene early enough with appropriate and intensive care, we can reduce a lot of impairments for many kids who have autism."

Research has shown that therapies focusing on behavior and communication can be helpful. Some drugs can also reduce certain related symptoms, but no medications have been approved by the U.S. Food and Drug Administration specifically for treating the main symptoms of autism.

"Because autism is such a complicated disorder, no one therapy fits everyone," Kasari explains.

Kasari and her colleagues developed and tested several treatments that focus on improving social skills and communication. In one study, preschoolers with autism received intense training in basic skills such as playing and sharing attention. Five years later, these children tended to have stronger vocabularies and better communication skills than children who received standard therapy.

"We've found that if we can improve these basic skills, we can also improve language learning for these kids," Kasari says. "We're now studying 2 potential therapies in at-risk babies, ages 12- to 21-months old, to see if



Web Links

For more about autism spectrum disorders, click the "Links" tab at:

<http://newsinhealth.nih.gov/issue/Sep2013/Feature1>

we can push language development along faster for the children."

Scientists are also looking for ways to predict likely outcomes for children with autism. One NIH-funded team found that the brain waves of some 2-year-olds with autism can have a distinctive pattern when they listen to familiar words. The children with more severe social symptoms didn't have a typical focused response in the brain region that processes language. Follow-up studies showed that these brain responses predicted the children's developmental abilities 2 and 4 years later.

"In the future, we'd like to be able to assess a child based on brain function or their genetic profile and then identify the intervention that might be best for that particular kid," Mandell says.

A growing number of studies are looking at autism in older age groups. "While we think about autism as a disorder of childhood, it actually continues through adolescence and into adulthood," Mandell says. "Some adults with autism have been misdiagnosed, and they can find themselves being treated for other conditions. We'd like to develop better screening tools and ultimately provide these adults with skills and supports to help them become happy and productive citizens."

While research is ongoing, it's clear that early diagnosis and treatment can improve outcomes for those with autism. If you're concerned about your child's social communication and behaviors, don't wait. Talk with your child's doctor. You may be referred to a specialist who can

do a thorough evaluation. The earlier autism is diagnosed, the sooner specific therapy can begin. ■

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Let Baby Set the Delivery Date

Wait Until 39 Weeks if You Can

We tend to think of pregnancy as lasting for 9 months. But ideally it should last for nearly 10 months. Research shows that babies are born healthier if they have at least 39 weeks to grow in the womb.

In recent years, there's been a trend toward earlier deliveries, as more women are choosing the date they'll give birth. This is known as an elective delivery. Studies suggest that the number of elective deliveries rose dramatically from 1990 to the mid-2000s.

If there's a particular medical reason to deliver early, then it's best not to wait, says Dr. Catherine Spong, a pregnancy expert at NIH. "But if the mother and baby are healthy, there's no benefit to delivering the baby early," she says. In fact, delivering early can create lasting health problems. Even women of advanced maternal age, older than 35, should wait until at least 39 weeks unless

there are medical reasons to deliver early.

"We've gotten to the point where people feel they can choose the timing of their delivery," says Spong. "But in reality, that baby, in the last 4 weeks of pregnancy, is doing a huge amount of developing."

Those last few weeks can make a big difference. At 39 to 40 weeks of pregnancy, a baby's brain weighs one-third more than it does at 35 weeks. The lungs and liver also continue to develop up to 39 weeks. And those last few weeks allow time for layers of fat to grow under the baby's skin, which helps keep the infant warm after birth.

Studies have found a greater risk of serious medical complications—such as dangerous bloodstream infections and breathing and feeding problems—in babies born before 39 weeks of **gestation**. "While there are risks to every pregnancy, the risks to the baby are higher if all organs are not completely developed," Spong says.

One NIH-funded study looked at more than 13,000 women who gave birth by elective **cesarean delivery** (C-section) at 37 weeks or later. The babies delivered at 37 weeks were twice as likely as those born at 39 weeks to have complications—such as difficulty breathing, heart problems and seizures—that usually require time in a neonatal intensive care unit.



Moms who choose to give birth early may also face their own health challenges. They have a greater chance of postpartum (after childbirth) depression; stronger, more frequent contractions during labor; and an increased chance of needing a C-section. Women who have a C-section have a greater risk of infection and a longer recovery time than women who've had a vaginal birth.

"Know the true due date of pregnancy and get **prenatal** care early," Spong advises.

A woman's body will go into labor when the baby is ready to enter the world, she says. "By letting that baby get born at term, you're improving the lifelong health of that baby." ■



Wise Choices For a Healthy Pregnancy

- See your health care provider for regular prenatal care.
- Talk to your doctor about the medicines you take. Some may not be safe during pregnancy.
- Follow a healthy diet.
- Take folic acid—at least 400 micrograms each day.
- Stay active. Ask your health care provider about physical activity that's safe for you.
- Avoid drinking alcohol and smoking.
- Control any existing conditions such as diabetes.
- If there are no medical reasons to deliver early, wait until at least 39 weeks for delivery.



Definitions

Gestation

The time from conception to birth.

Cesarean Delivery (C-section)

Surgery to deliver a baby through the mother's abdomen.

Prenatal

Before birth or during pregnancy.



Web Links

For more about healthy pregnancy and delivery, click the "Links" tab at:

<http://newsinhealth.nih.gov/issue/Sep2013/Feature2>

Health Capsules

For links to more information, see these stories online:
<http://newsinhealth.nih.gov/issue/Sep2013/Capsule1>

Young Adult Obesity May Affect Later Heart Disease

The longer a young adult is obese, the greater the chance of developing heart disease in middle age, a new study reports. The finding hints that preventing or even delaying the onset of obesity might help reduce heart disease in later years.

Heart disease is the leading cause of death nationwide, and obesity boosts the risk for heart disease. Past studies have linked both body mass index (BMI)—a ratio of weight to height—and waist circumference to heart disease risk. However, few studies have looked at whether the length of time a person is obese affects heart disease as well.

To learn more, a team led by NIH's Dr. Jared Reis studied more than

3,200 young adults, ages 18 to 30, who weren't obese at the start of the study. The subjects were followed over a 25-year period to see if and when they became obese and for how long. Heart scans looked for calcium deposits in their coronary arteries, an early warning sign of heart disease. These calcifications can arise long before symptoms are noticed—a condition called silent heart disease.

About 40% of the adults became obese during the study. Over 38% of those who were obese for more than 2 decades developed coronary artery calcification. In contrast, only about 25% of those who never became obese developed calcification. The

scientists calculated that each year a young adult is obese raises that person's risk of developing silent heart disease by 2-4%.

People in the U.S. are becoming obese at younger ages, and more than one-third of adults are obese.

"I think our findings really suggest that if we don't measure obesity duration in addition to BMI and waist circumference, we may be underestimating the health risks of obesity," Reis says. ■

Considering Probiotics?

You might have noticed "probiotics" listed on the label of your yogurt. Maybe you've seen probiotic pills on store shelves next to vitamins or other supplements.

Probiotics are live microbes, such as bacteria, similar to those found naturally in the human body. We tend to think of microbes as harmful, but certain kinds are good for us and help the body to function properly.

Probiotics are found in some foods or are taken by mouth as dietary supplements. Probiotics also come in other products, such as creams.

The U.S. Food and Drug Administration hasn't approved any health claims for probiotics. Although some products have shown promise, there's little evidence to support

specific uses of probiotics for most conditions.

Some evidence suggests that probiotics may relieve diarrhea, ease irritable bowel syndrome and reduce symptoms of atopic eczema, an itchy skin condition usually seen in infants. Probiotics generally have few side effects, but there's little data about their long-term safety.

Talk with your health care provider before taking probiotics for a health condition. These products contain different types of bacteria, and their effects on the body can vary from person to person. Probiotics might cause serious side effects in people with underlying health conditions. To learn more about probiotics, visit <http://nccam.nih.gov/health/probiotics>. ■



Featured Website NIEHS Kids' Pages

<http://kids.niehs.nih.gov>

Here's some educational fun for bright young minds. Kids can learn about nature and healthy living, play games and explore activities about science, health and the environment. Find resources for parents and teachers, too. From NIH's National Institute of Environmental Health Sciences (NIEHS).



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