Pediatric Patient Education™
Expert advice from the American Academy of Pediatrics

ASD—What Causes Autism Spectrum Disorder?

Children with autism spectrum disorder (ASD) do not have one common cause or reason they have ASD. Here is information from the American Academy of Pediatrics about the causes of ASD.

Many factors may lead to a diagnosis of ASD. Scientists continue to learn more about what causes ASD. We currently know that

- Families do not cause ASD.
- Vaccines do not cause ASD.
- Family medical history may tell us something. If a family already has a child diagnosed with ASD, the chance that a sibling might also have ASD is 10 to 20 times higher than for the general population. Studies have shown that relatives of children with ASD are more likely to share some similar social and behavioral characteristics to those seen among children with ASD. However, these characteristics may not be severe enough to merit a diagnosis.
- Most children with ASD do not have a specific medical condition or genetic condition that explains their ASD. However, ASD may occur more often in children with certain medical conditions or high risk factors. These medical conditions can include fragile X syndrome, tuberous sclerosis complex, Down syndrome, or other genetic disorders. Infants born preterm are another high-risk group. Considering whether a child with ASD has a genetic condition is an important part of the initial evaluation.
- There are specific differences in brain function between a child with ASD and a child without ASD.
- Potential environmental factors are also an important area of research and are not yet well understood.

Is there a link between vaccines and ASD?

Some people believe that vaccines cause ASD. However, many studies show there is no scientifically proven link between childhood vaccines, including the measles-mumps-rubella (MMR) vaccine, and ASD. In fact, the research article that first suggested a link between the MMR vaccine and ASD has been retracted (removed permanently) because the research was done incorrectly. There is also no scientific proof to support a link between thimerosal (a mercury-containing preservative) and ASD. Even so, almost all vaccines given to children in the United States no longer contain mercury. Mercury was removed in the early 2000s.

The AAP urges parents to have their children fully immunized. Vaccines are a safe and effective way to protect children from diseases. Families who remain concerned about vaccines and ASD should talk with their child's doctor.

What is known about brain development in children with ASD?

The specific differences in brain function that cause ASD are not known. However, research has shown that

- There is a difference in brain growth in children with ASD, with a tendency for brains to grow faster and be larger than usual in early childhood (often with a larger head size).
- There are various microscopic (very small) differences in brain areas, such as the cerebellum, limbic system, and cerebral cortex, of people with ASD.

- There are differences in some brain chemicals (neurotransmitters) in children with ASD. These brain chemicals are important regulators of brain development, nerve communication, and function. However, no single abnormality has been found in all people with ASD.
- There are some differences in the function of certain parts of the brain in children with ASD, including how the brain recognizes faces, processes language, and allows for the imitation of other people. Measurement of chemical neurotransmitters and imaging techniques of brain function are not currently available for the evaluation of children with autism. These tests and other studies may be important in research. Although our understanding of differences in brain structure and function is increasing, there is still much to be learned.

Visit HealthyChildren.org for more information.

Adapted from the American Academy of Pediatrics patient education booklet, *Understanding Autism Spectrum Disorder (ASD)*.