NATIONAL ACADEMY OF NEUROPSYCHOLOGY

UNDERSTANDING THE CAUSES OF AUTISM AND THE SAFETY OF VACCINES

↓ WHAT IS AUTISM SPECTRUM DISORDER (ASD)?

ASD is a complex neurodevelopmental condition, characterized by challenges in social interaction and communication, repetitive behaviors, and limited or restricted interests that are present from early childhood (Hirota & King, 2023). Decades of rigorous research helps us to understand what factors contribute to ASD and what factors do not.

↓ DO VACCINES CAUSE ASD?

Simply stated, there is no credible research showing that vaccines cause ASD. This lingering myth stems from an initial "study" of the measles, mumps, and rubella (MMR) vaccine that was later retracted due to ethical violations and data falsification. The doctor who performed that study, Andrew Wakefield, ultimately lost his medical license (Flaherty, 2011).

Here are some important points to keep in mind:

- Multiple large-scale studies of thousands of children from different countries, including the United States, consistently show that there is no causal link between MMR vaccines and ASD (Jain et al., 2015; Hviid et al., 2019).
- Thimerosal, a mercury-containing preservative in some vaccines, does not cause ASD. The reduction and removal of Thimerosal from vaccines in the early 2000s did not impact rates of ASD (Hurley et al., 2010).
- Vaccines are essential for public health. They help control preventable illnesses and diseases that can negatively impact brain development and in some cases can be fatal. Vaccines undergo rigorous safety testing and continuous surveillance by both global health agencies and independent foundations (Conklin et al, 2021).

For evidence-based answers to other common questions about vaccines, see Geoghegan et al. (2020): https://bit.ly/commonvaxmyths.

↓ IF NOT VACCINES, THEN WHAT CAUSES ASD?

The cause or causes of ASD are not known, but there are many known factors associated with an increased risk for ASD. Such risk factors can differ between individuals. This is because ASD is a "spectrum" of related disorders, not a single disorder.

- Genetics: ASD is highly heritable, meaning that a large proportion of variation in ASD (50-90%) can be attributed to genetics. This includes both inherited genetic mutations as well as spontaneous ("de novo") mutations that the parents do not have. Environmental factors sometimes cause de novo mutations or activate inherited mutations.
- Environment: ASD risk increases with advanced parental age, maternal infections during pregnancy (e.g., rubella, cytomegalovirus), and prenatal exposure to certain toxins (e.g., valproic acid, thalidomide, air pollutants). Additional risk factors include premature birth, low birth weight, and insufficient oxygen during delivery (Chaste & Leboyer, 2012).

↓ TO LEARN MORE:

- Chaste, P. & Leboyer, M. (2012). Autism risk factors: Genes, environment, and gene-environment interactions. https://bit.ly/ASDrisks
- Conklin, L., Hviid, A., Orenstein, W. A., Pollard, A. J., Wharton, M., & Zuber, P. (2021). Vaccine safety issues at the turn of the 21st century. BMJ Global Health, 6(Suppl 2), e004898. https://doi.org/10.1136/bmjgh-2020-004898
- Flaherty, D.K. (2011). The vaccine-autism connection: a public health crisis caused by unethical medical practices and fraudulent science. Annals of Pharmacotherapy, 45(10), 1302-1304. doi: 10.1345/aph.1Q318.
- Hirota, T. & King, B.H. (2023). Autism Spectrum Disorder: A Review. JAMA, 329(2), 157–168. doi:10.1001/jama.2022.23661
- Hurley, A. M., et al. (2010): Thimerosal-containing vaccines and autism: A review of recent epidemiologic studies. https://bit.ly/ThimerosalASD
- Hviid, A., et al. (2019): Measles, mumps, rubella vaccination and autism: A nationwide cohort study. https://bit.ly/MMR_ASD
- Jain, A., et al. (2015): Autism occurrence by MMR vaccine status among US children with older siblings with and without autism. https://bit.ly/ASD_MMR
- Lord, C., et al. (2018) : Autism Spectrum Disorder. https://bit.ly/Lord2018