

Executive Summary

In its commitment to promoting healthy children, youth, and families, grounded firmly in a foundation of science and health equity, the New York State Department of Health in partnership with the New York City Department of Health has evaluated recent research to assess whether current evidence based medical literature finds prenatal exposure to acetaminophen causes autism in children.

After a thorough review of extant literature, the Departments conclude:

1. Acetaminophen use during pregnancy, used when indicated and at recommended doses, remains a safe therapeutic option.
2. No *causal* link has been established between prenatal acetaminophen exposure and autism spectrum disorder (ASD).
3. Clinicians should continue to balance potential risks against the established benefits of acetaminophen use for any pregnant patients under their care.

Introduction

Acetaminophen has long been considered one of the safest options for pain and fever relief during pregnancy. Because of its over-the-counter availability, exact usage rates are difficult to quantify, however estimates suggest that over half of pregnant people worldwide use acetaminophen at least once during pregnancy.^{1,2}

Clinical diagnoses for neurodevelopmental disorders, including autism spectrum disorder, have increased in recent decades due to several factors, including increased awareness, earlier screening, and a broadening of diagnostic criteria.^{1,3} While this increase in diagnoses has sparked debate and increased interest in identifying the cause of this trend, the consensus among researchers and clinicians is that autism does not have a single cause; rather, it arises from the complex interplay of multiple genetic predispositions and environmental factors.⁴

¹ Chahboun S, Stenseng F, Page AG. The changing faces of autism: The fluctuating international diagnostic criteria and the resulting inclusion and exclusion-A Norwegian perspective. *Front Psychiatry*. 2022 Jul 28;13:787893. doi: 10.3389/fpsyt.2022.787893.

² Bauer AZ, Swan SH, Kriebel D, Liew Z, Taylor HS, Bornehag CG, Andrade AM, Olsen J, Jensen RH, Mitchell RT, Skakkebaek NE, Jégou B, Kristensen DM. Paracetamol use during pregnancy - a call for precautionary action. *Nat Rev Endocrinol*. 2021 Dec;17(12):757-766. doi: 10.1038/s41574-021-00553-7.

³ Whitehouse AJ, Cooper MN, Bebbington K, Alvares G, Lin A, Wray J, Glasson EJ. Evidence of a reduction over time in the behavioral severity of autistic disorder diagnoses. *Autism Res*. 2017 Jan;10(1):179-187. doi: 10.1002/aur.1740.

⁴ Parshall, A. "Autism Has No Single Cause, Research Shows." *Scientific American*, 10 Sept. 2025, www.scientificamerican.com/article/autism-has-no-single-cause-research-shows/.

Does acetaminophen use in pregnancy cause autism?

No. While some observational and retrospective studies have suggested small associations, the most rigorous evidence does not support a causal link. Large international registry and sibling-comparison studies involving millions of children over multiple decades found no association once genetic and family factors were controlled. The data showed that around 1.42% of children exposed to acetaminophen during pregnancy were later diagnosed with autism, compared with 1.33% of children who were not exposed, a very small and statistically negligible difference.¹⁴

Smaller biomarker studies and ones that rely on self-reporting have shown modest correlations, but these are likely explained by recall bias, small sample size, and confounding factors such as fever, infection, or pain that prompted acetaminophen use in the first place. Scientists consistently emphasize that correlation does not prove causation. Additionally, some research suggests acetaminophen use in pregnancy has declined over time,⁵ even as autism diagnoses have continued to rise - further evidence that the two trends do not move together.

Why are autism diagnoses increasing?

Numerous studies have demonstrated the rise is largely due to changes in how autism is recognized and diagnosed rather than a sudden increase in the condition itself.¹ Broadened diagnostic criteria, earlier screening, greater public and professional awareness,⁶ and improved access to services all contribute to higher reported prevalence. Experts caution against attributing the trend to a single environmental exposure. It is worth noting that increased diagnoses tend to be on the milder end of the spectrum,³ supporting the notion that broadened diagnostic criteria can at least partially be attributed to the rise in cases.

What do experts believe causes autism?

Experts widely believe that autism has no single cause.⁵ It arises from a complex and not very well-understood combination of factors. However, genetics likely plays the largest role with twin studies suggest up to 85–90% of risk is inherited.⁷ Environmental factors during pregnancy, such as advanced parental age, maternal infection, metabolic conditions like diabetes, nutrient deficiencies, and certain pollutants, may

⁵ Bandoli G, Palmsten K, Chambers C. Acetaminophen use in pregnancy: Examining prevalence, timing, and indication of use in a prospective birth cohort. *Paediatr Perinat Epidemiol*. 2020 May;34(3):237-246. doi: 10.1111/ppe.12595.

⁶ Russell G, Collishaw S, Golding J, Kelly SE, Ford T. Changes in diagnosis rates and behavioural traits of autism spectrum disorder over time. *BJPsych Open*. 2015 Oct 7;1(2):110-115. doi: 10.1192/bjpo.bp.115.000976.

⁷ Tick B, Bolton P, Happé F, Rutter M, Rijdsdijk F. Heritability of autism spectrum disorders: a meta-analysis of twin studies. *J Child Psychol Psychiatry*. 2016 May;57(5):585-95. doi: 10.1111/jcpp.12499.

also contribute modestly.^{8,9,10,11,12} But these influences interact with genetic susceptibility rather than acting alone.

What are the risks of not using acetaminophen when medically indicated?

Untreated fever and significant pain during pregnancy are known to carry risks, including miscarriage, congenital malformations, preterm birth, maternal hypertension, depression, and even increased risk of autism linked to fever itself. Studies also show that treating fever with acetaminophen can reduce that risk. Acetaminophen remains the safest recommended option for fever and pain relief in pregnancy, while alternatives such as ibuprofen and aspirin carry well-documented risks.^{5,6,7}

Conclusion

Recent evidence does not support a causal link between prenatal acetaminophen exposure and autism. Small associations seen in some studies likely reflect confounding by other factors and methodological limitations of the research studies. Research consensus still concludes that autism spectrum disorder remains primarily driven by genetic factors and other environmental risks, not acetaminophen use.

Acetaminophen remains the safest recommended analgesic and fever-reducer in pregnancy. Non-steroidal anti-inflammatory medications like ibuprofen carry established risks, including miscarriage, stillbirth, congenital malformations, and delayed development.¹³ Additionally, untreated fever and pain carry significant risks, including miscarriage, preterm birth, congenital anomalies, maternal hypertension, and depression, all of which may contribute to neurodevelopmental risk.

Clinicians should continue to recommend acetaminophen when medically indicated and pregnant patients should consult with their physicians before medication use.

⁸ Ye W, Luo C, Zhou J, Liang X, Wen J, Huang J, Zeng Y, Wu Y, Gao Y, Liu Z, Liu F. Association between maternal diabetes and neurodevelopmental outcomes in children: a systematic review and meta-analysis of 202 observational studies comprising 56.1 million pregnancies. *Lancet Diabetes Endocrinol*. 2025 Jun;13(6):494-504. doi: 10.1016/S2213-8587(25)00036-1.

⁹ Love C, Sominsky L, O'Hely M, Berk M, Vuillermin P, Dawson SL. Prenatal environmental risk factors for autism spectrum disorder and their potential mechanisms. *BMC Med*. 2024 Sep 16;22(1):393. doi: 10.1186/s12916-024-03617-3.

¹⁰ Idring S, Magnusson C, Lundberg M, Ek M, Rai D, Svensson AC, Dalman C, Karlsson H, Lee BK. Parental age and the risk of autism spectrum disorders: findings from a Swedish population-based cohort. *Int J Epidemiol*. 2014 Feb;43(1):107-15. doi: 10.1093/ije/dyt262.

¹¹ Jiang HY, Xu LL, Shao L, Xia RM, Yu ZH, Ling ZX, Yang F, Deng M, Ruan B. Maternal infection during pregnancy and risk of autism spectrum disorders: A systematic review and meta-analysis. *Brain Behav Immun*. 2016 Nov;58:165-172. doi: 10.1016/j.bbi.2016.06.005.

¹² Moschetti A, Giangreco M, Ronfani L, Cervellera S, Ruffilli MP, Nume C, Barbi E, Servidio AG. An ecological study shows increased prevalence of autism spectrum disorder in children living in a heavily polluted area. *Sci Rep*. 2024 Jul 26;14(1):17159. doi: 10.1038/s41598-024-67980-0.

¹³ Nunge RA, Kendle AM, Alwan S. Pain medication use during pregnancy. *Semin Perinatol*. 2025 Jun;49(4):152074. doi: 10.1016/j.sempri.2025.152074.