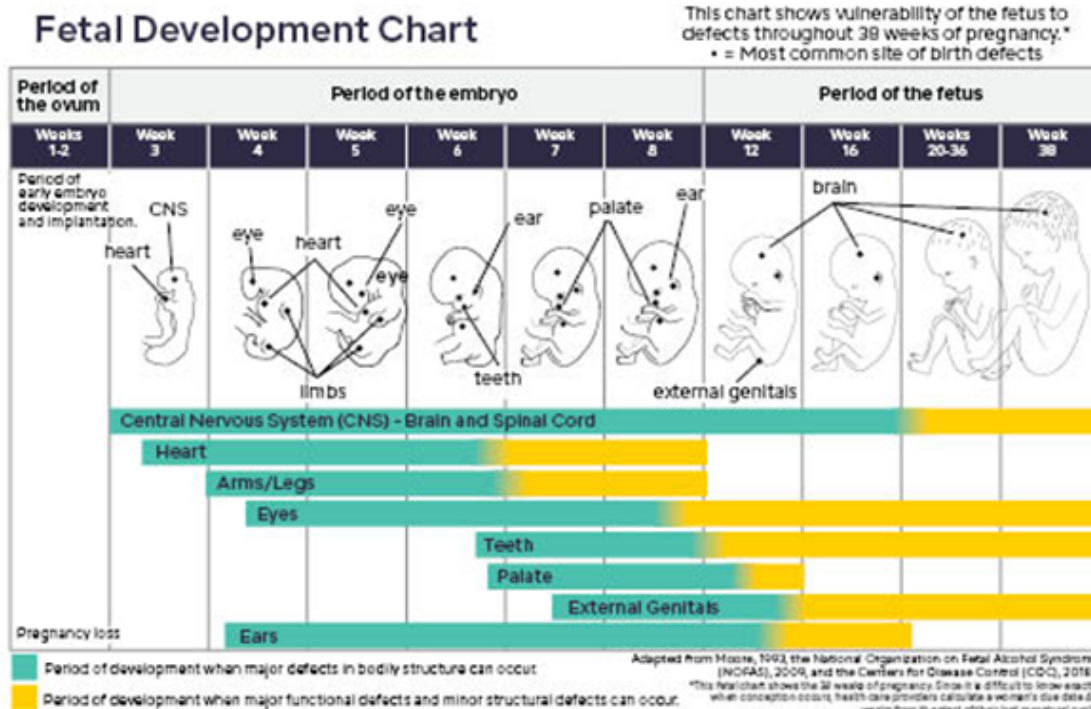


How Does Alcohol Effect Pregnancy?



Alcohol is a teratogen.² A teratogen is something that causes birth defects. For example, tobacco, lead and alcohol are all teratogens. Drinking during pregnancy can have serious effects on how the fetus develops. It can harm different organs, and it is especially harmful to the brain.³ The brain is developing throughout the entire pregnancy.⁴ Because of this, drinking alcohol during any trimester can cause brain injury.^{5, 6, 7, 8} It can also cause microcephaly, which is when the head and brain are much smaller than expected.^{9, 10} These effects to the brain can lead to mild to severe disabilities.¹¹

People with prenatal alcohol exposure may have trouble with things like:

- attention
- behavior
- learning
- language
- memory¹²

Drinking during pregnancy can also cause:

- heart problems¹³
- increased risk of infections¹⁴
- difficulty with movement¹⁵
- other health issues

Any amount of alcohol, even if it's just one glass of wine, passes from the mother to the fetus.¹⁶ All major health groups state that there is no known safe amount of alcohol during pregnancy.

These health groups include:

- Centers for Disease Control (CDC)¹⁷
- American Academy of Pediatrics¹⁸
- American College of Obstetricians and Gynecologists (ACOG)¹⁹
- U.S. Surgeon General²⁰

There is no safe time to drink during pregnancy. Drinking during any of the 3 trimesters can affect the fetus. It makes no difference if the alcohol is wine, beer, or hard liquor (like vodka or rum).²¹

There can be different effects to the fetus depending on when the drinking happens. Some of these effects (but not all of them) are shared below.

1ST TRIMESTER	2ND TRIMESTER	3RD TRIMESTER
Major effects on: <ul style="list-style-type: none">• Brain• Spinal cord• Heart• Face	Major effects on: <ul style="list-style-type: none">• Brain• Spinal cord• Immune system	Major effects on: <ul style="list-style-type: none">• Brain• Spinal cord• Bones
12 times more likely to have FASD if drinking happens during the 1st trimester	61 times more likely to have FASD if drinking happened in both the 1st and 2nd trimesters	65 times more likely to have FASD if drinking happened during all 3 trimesters

Chart sources: 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34

Everyone plays a role in preventing FASD:

- If you can become pregnant, talk with your care provider about preventing an alcohol exposed pregnancy.
- If you are a health care provider, take every opportunity to have conversations with patients about alcohol use before and during pregnancy.
- Become an advocate for change as it relates to alcohol policies in your community and state.
- Learn more about FASD and how you can support those impacted by this disorder at proofalliance.org.



Sources:

1. Centers for Disease Control and Prevention. FASD Brochure: Final. https://www.cdc.gov/ncbddd/fasd/documents/fasdbrochure_final.pdf
2. Hong M, Krauss RS. Ethanol Itself is a Holoprosencephaly-inducing Teratogen. *PloS One*. 2017;12(4):e0176440.
3. Burd L, Blair J, Dropps K. Prenatal Alcohol Exposure, Blood Alcohol Concentrations and Alcohol Elimination Rates for the Mother, Fetus and Newborn. *Journal of Perinatology*. 2012;32:652-659.
4. Centers for Disease Control and Prevention. Alcohol Use in Pregnancy. <https://www.cdc.gov/ncbddd/fasd/alcohol-use.html>
5. Girault V, et al. Prenatal Alcohol Exposure Impairs Autophagy in Neonatal Brain Cortical Microvessels. *Cell Death & Disease*. 2017; 8(e2610).
6. Muralidharan P, Sarmah S, Feng C, Zhou, Marrs JA. Fetal Alcohol Spectrum Disorder (FASD) Associated Neural Defects: Complex Mechanisms and Potential Therapeutic Targets. *Brain Sciences* (2076-3425). 2013;3(2):964-991.
7. Lewis SM, Vydrová RR, Leuthold AC, Georgopoulos AP. Cortical miscommunication after prenatal exposure to alcohol. *Experimental Brain Research*. 2016;234(11):3347-3353.
8. Sharma VK, Hill SY. Differentiating the effects of familial risk for alcohol dependence and prenatal exposure to alcohol on offspring brain morphology. *Alcoholism: Clinical and Experimental Research*. 2017;41(2):312-322.
9. Treit S, Zhou D, Chudley AE, et al. Relationships between Head Circumference, Brain Volume and Cognition in Children with Prenatal Alcohol Exposure. *PLoS ONE*. 2016;11(2):1-15.
10. Feldman HS, et al. Prenatal Alcohol Exposure Patterns and Alcohol-Related Birth Defects and Growth Deficiencies: A Prospective Study. *Alcohol Clin Exp Res*. 2012;36(4):670-676.
11. Noor S, Milligan ED. Lifelong Impacts of Moderate Prenatal Alcohol Exposure on Neuroimmune Function. *Frontiers in Immunology*. 2018.
12. Flak AL, Su S, Bertrand J, Denny CH, Kesmodel US, Cogswell ME. The association of mild, moderate, and binge prenatal alcohol exposure and child neuropsychological outcomes: A Meta-analysis. *Alcohol Clin Exp Res*. 2014;38(1):214-26.
13. Westrup S. Foetal Alcohol Spectrum Disorders: as prevalent as autism?. *Educational Psychology in Practice*. 2013;29(3): 309-325.
14. Noor S, Milligan ED. Lifelong Impacts of Moderate Prenatal Alcohol Exposure on Neuroimmune Function. *Frontiers in Immunology*. 2018.
15. Taggart TC, Simmons RW, Thomas JD, Riley EP. Children with Heavy Prenatal Alcohol Exposure Exhibit Atypical Gait Characteristics. *Alcoholism: Clinical & Experimental Research*. 2017;41(9):1648-1655.
16. Burd L, Blair J, Dropps K. Prenatal alcohol exposure, blood alcohol concentrations and alcohol elimination rates for the mother, fetus and newborn. *Journal of Perinatology*. 2012;32:652-659.
17. Centers for Disease Control and Prevention. Fetal Alcohol Spectrum Disorders (FASDs). <https://www.cdc.gov/ncbddd/fasd/alcohol-use.html>
18. American Academy of Pediatrics. AAP Says No Amount of Alcohol Should Be Considered Safe During Pregnancy. <https://www.aap.org/en-us/about-the-aap/aap-press-room/Pages/AAP-Says-No-Amount-of-Alcohol-Should-be-Considered-Safe-During-Pregnancy.aspx>
19. American College of Obstetricians and Gynecologists (ACOG). Fetal alcohol spectrum disorders (FASD) prevention program. <https://www.acog.org/About-ACOG/ACOG-Departments/Tobacco--Alcohol--and-Substance-Abuse/Fetal-Alcohol-Spectrum-Disorders-Prevention-Program>
20. Centers for Disease Control and Prevention. Notice to Readers: Surgeon General's Advisory on Alcohol Use in Pregnancy. <https://www.cdc.gov/mmwr/preview/mmwrhtml/mm5409a6.htm>
21. Centers for Disease Control and Prevention. Alcohol Use in Pregnancy. <https://www.cdc.gov/ncbddd/fasd/alcohol-use.html>
22. Centers for Disease Control and Prevention. FASD Brochure: Final. https://www.cdc.gov/ncbddd/fasd/documents/fasdbrochure_final.pdf
23. Lebel C, Roussotte F, Sowell ER. Imaging the Impact of Prenatal Alcohol Exposure on the Structure of the Developing Human Brain. *Neuropsychol Rev*. 2011;21:102-118.
24. Girault V, et al. Prenatal Alcohol Exposure Impairs Autophagy in Neonatal Brain Cortical Microvessels. *Cell Death & Disease*. 2017; 8(e2610).
25. Muralidharan P, Sarmah S, Feng C, Zhou, Marrs JA. Fetal Alcohol Spectrum Disorder (FASD) Associated Neural Defects: Complex Mechanisms and Potential Therapeutic Targets. *Brain Sciences* (2076-3425). 2013;3(2):964-991.
26. Lewis SM, Vydrová RR, Leuthold AC, Georgopoulos AP. Cortical miscommunication after prenatal exposure to alcohol. *Experimental Brain Research*. 2016;234(11):3347-3353.
27. Sharma VK, Hill SY. Differentiating the effects of familial risk for alcohol dependence and prenatal exposure to alcohol on offspring brain morphology. *Alcoholism: Clinical and Experimental Research*. 2017;41(2):312-322.
28. Treit S, Zhou D, Chudley AE, et al. Relationships between Head Circumference, Brain Volume and Cognition in Children with Prenatal Alcohol Exposure. *PLoS ONE*. 2016;11(2):1-15.
29. Feldman HS, et al. Prenatal Alcohol Exposure Patterns and Alcohol-Related Birth Defects and Growth Deficiencies: A Prospective Study. *Alcohol Clin Exp Res*. 2012;36(4):670-676.
30. Sawada Feldman H, Lyons Jones K, Lindsay S, et al. Prenatal Alcohol Exposure Patterns and Alcohol-Related Birth Defects and Growth Deficiencies: A Prospective Study. *Alcoholism: Clinical & Experimental Research*. 2012;36(4):670-676.
31. Bake S, Tingling JD, Miranda RC. Ethanol Exposure During Pregnancy Persistently Attenuates Cranially Directed Blood Flow in the Developing Fetus: Evidence from Ultrasound Imaging in a Murine Second Trimester Equivalent Model. *Alcoholism: Clinical and Experimental Research*. 2012;36:748-758
32. May PA et al. Maternal alcohol consumption producing fetal alcohol spectrum disorders (FASD): quantity, frequency, and timing of drinking. *Drug and Alcohol Dependence*. 2013; 133(2): 502-512.
33. Gauthier TW. Prenatal Alcohol Exposure and the Developing Immune System. *Alcohol Research: Current Reviews*. 2015;37(2):e1-e7.
34. Sawant OB, Ramadoss J, Hogan HA, Washburn SE. The role of acidemia in maternal binge alcohol-induced alterations in fetal bone functional properties. *Alcohol Clin Exp Res*. 2013;37(9):1476-82.