

# PRoF Alliance NC

## Building an Alliance: Preventing Alcohol Exposed Pregnancies


**NCPHA Fall Educational Conference  
September 28<sup>th</sup>, 2023**

**Proof Alliance NC** strives to prevent alcohol-exposed pregnancies by providing training, education, and resources to professionals who serve individuals of reproductive age; as well as professionals who provide support to families and people impacted by fetal alcohol spectrum disorders (FASD).

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“The views and opinions expressed in this session are those of the speakers and do not necessarily reflect the views or positions of funders (specifically, NC DHHS DMH/DD/SUS)”





Proof Alliance acknowledges that not every person who can become pregnant identifies as a woman. We try to use gender-neutral language as often as possible, much of the current research refers only to “women” when discussing the ability to become pregnant. When citing this research, we refer to the language used in the study. In these cases, “woman” refers to someone who was assigned female at birth.





# Objectives

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**After this presentation, you'll have a better understanding of:**

- What FASD is and how it presents across the lifespan.
- Alcohol, standard servings and binge drinking.
- The importance of planned pregnancies and preventing alcohol-exposed pregnancies.
- Our call to action!

# What is FASD?

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## Fetal Alcohol Spectrum Disorder

- Brain-based
  - Medical disorder
  - Caused by prenatal alcohol exposure (drinking during pregnancy)
  - Effects are lifelong and irreversible
  - 100% preventable
  - Early identification and support can help individuals with FASD reach their potential
- .....





# 1973

The effects of prenatal alcohol exposure were first recognized in research journals in the early 70s. The effects were referred to as 'fetal alcohol syndrome'



# 1996

In 1996, the Institute of Medicine split this medical condition into five different diagnoses.



# 2000+

The effects of prenatal alcohol exposure are now referred to as a whole spectrum. FASD includes all five diagnoses first identified in 1996.

# Did you know?

## FASD is an umbrella term.

- **Fetal Alcohol Syndrome (FAS):** Facial abnormalities, growth deficits, CNS abnormalities and neurobehavioral impairment
- **Partial Fetal Alcohol Syndrome (pFAS):** Facial features and neurobehavioral impairment plus documentation of prenatal alcohol exposure; If no prenatal alcohol exposure also needs growth deficiency or deficient brain growth
- **Alcohol Related Birth Defects (ARBD):** Documented prenatal alcohol exposure and 1 or more specific major malformations documented to be the result of prenatal alcohol exposure
- **Alcohol Related Neurodevelopmental Disorder (ARND):** Documented prenatal alcohol exposure and neurobehavioral impairment
- **ND-PAE:** Neurobehavioral disorder associated with prenatal alcohol exposure (mental health diagnosis) \**ND-PAE has been recently added to the DSM-V*

\***FAE:** fetal alcohol effects (outdated term)



# Facial features

It's a common myth that all people with an FASD have a specific set of facial features.

- The fact is only 10-15% of people with FASD have these facial features.
- The features tend to become less visible as the person ages.







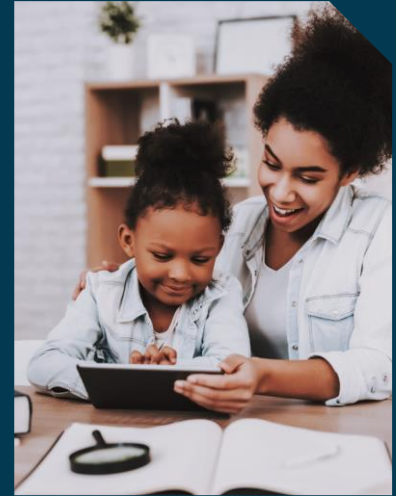
**True or false?**

FASD is more common than Down Syndrome.



**True or false?**

FASD is more common than autism.



**True or false?**

FASD is the leading preventable I/DD in the United States.

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# 1 in 20

Experts estimate that as many as 1 in 20 children in the U.S. have an FASD.

# Characteristics of FASD

This is only a small sampling of the characteristics that are common with FASD.

- Low birthweight, slow to develop
- Irritability or anger
- Sensitivity to light, noise and touch
- Trouble sleeping
- Hyperactivity
- Speech and language delays
- Easily distracted, short attention span





## Other common characteristics of FASD

### Impaired Executive Functioning

- Memory and attention
- Impulse control
- Abstract concepts
- Cause and effect
- Organizing stored information
- Planning future events
- Problem solving
- Generalizing concepts

# What Else Can FASD Look Like?

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- Attention deficit hyperactivity disorder (ADHD)
- Autism Spectrum Disorder (ASD)
- Reactive attachment disorder (RAD)
- Sensory processing disorder
- Bipolar disorder
- Depression
- Anxiety
- Trauma
- Institutionalization
- & more...



**It is estimated over  
90% of individuals  
with an FASD have  
a co-occurring  
mental health  
disorder.**

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# Diagnosing in North Carolina

## **Fullerton Genetics**

9 Vanderbilt Park Drive,  
Asheville, NC 28803  
828-213-0022, Fax 828-213-0039  
Dr. Chad Haldeman-Englert  
Dr. William Allen

## **Atrium Health-Levine Children's Hospital**

Fetal Alcohol Spectrum Disorders Clinic  
Developmental and Behavioral Pediatrics Clinic  
2608 E. Seventh Street  
Charlotte, North Carolina 28204  
704-403-2626, Fax 704-403-2699  
Dr. Yasmin Senturias, MD

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Alcohol causes more birth defects than smoking and illegal drugs.

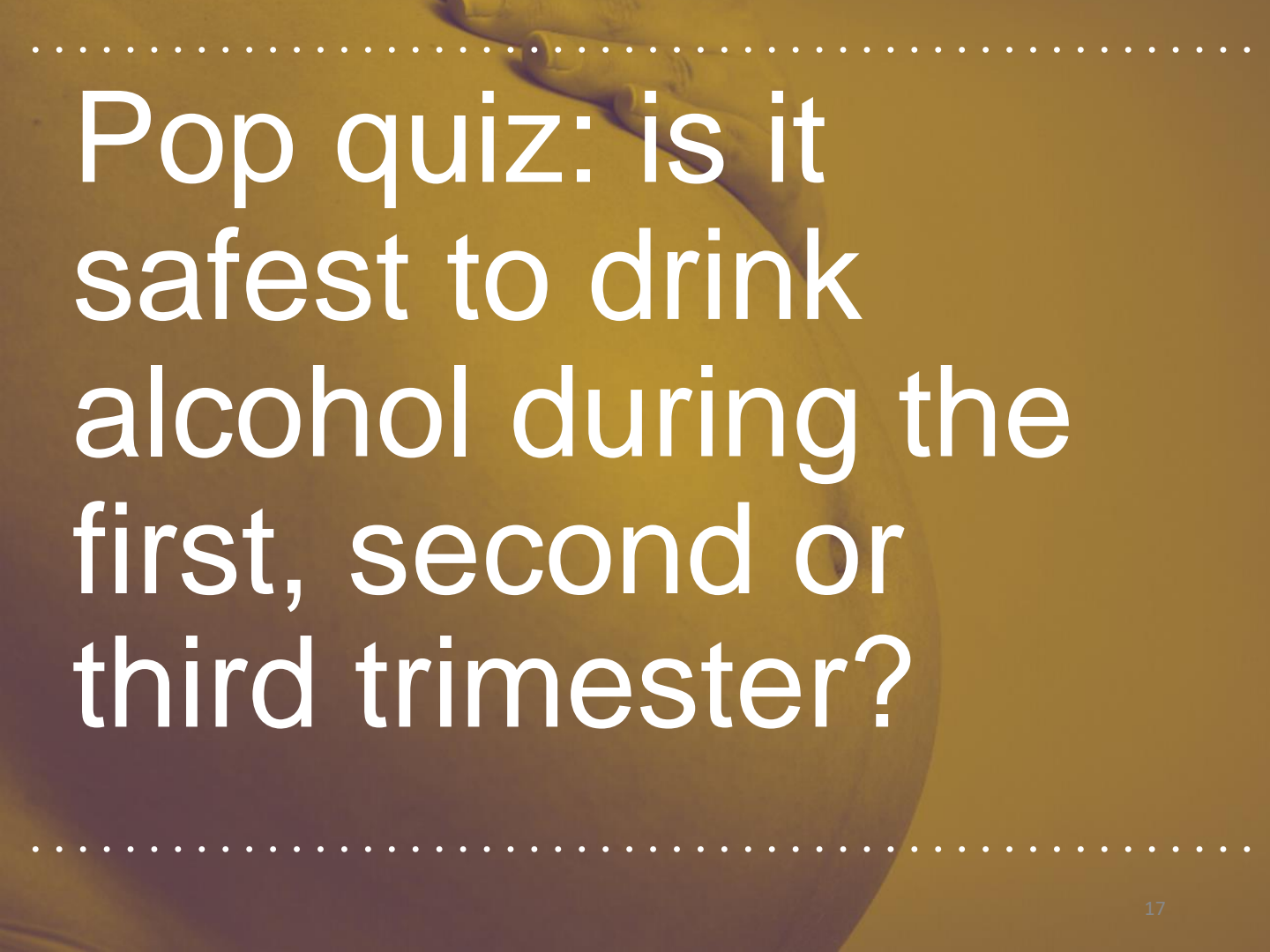


# Other birth defects caused by prenatal alcohol exposure

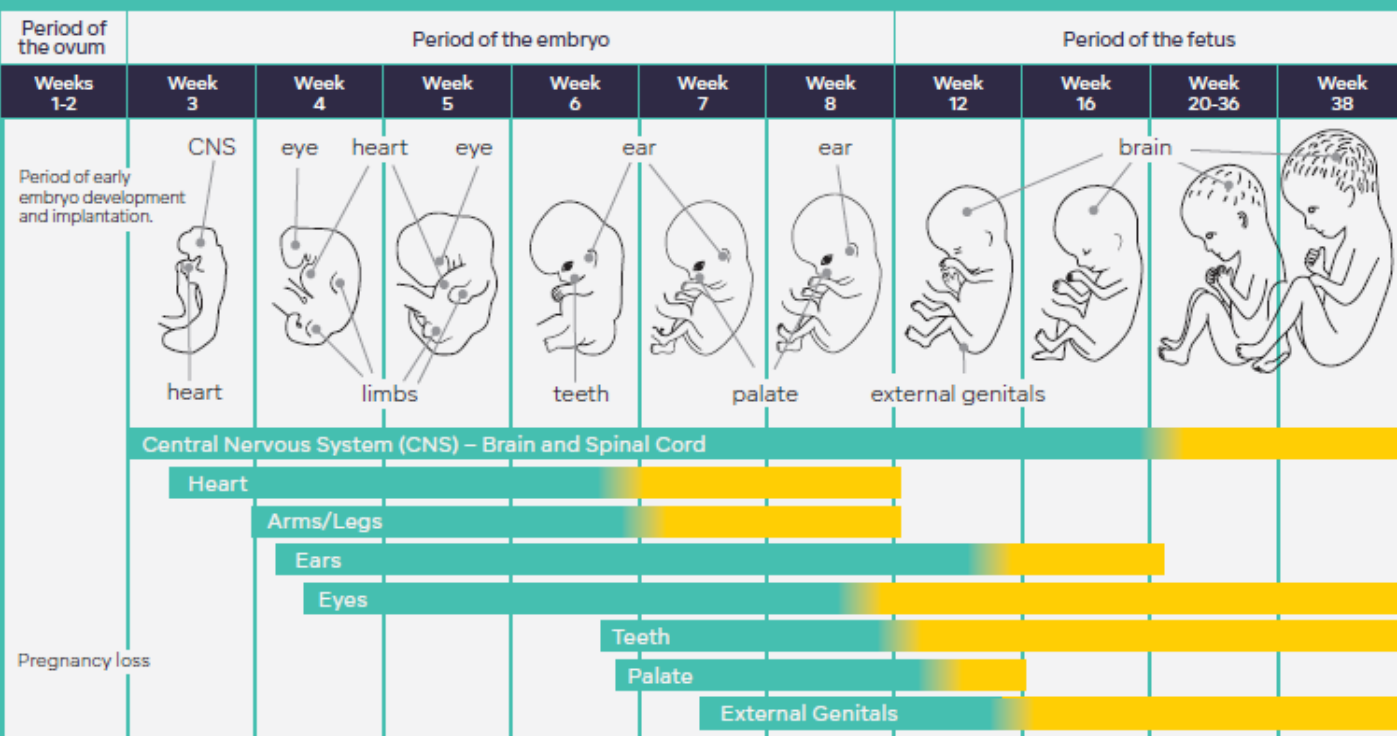
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**In addition to FASD, drinking while pregnant can cause:**

- Structural brain injury
  - Microcephaly
  - Heart defects
  - Hearing and vision problems
  - Abnormal development in the bones, kidneys and other organs
  - Abnormal facial development in the lips, mid-face and eyes
-

A hand holding a glass of wine against a warm, golden background. The text is overlaid on the image.

Pop quiz: is it  
safest to drink  
alcohol during the  
first, second or  
third trimester?



- Most common site of birth defects
- Period of development when major defects in bodily structure can occur.
- Period of development when major functional defects and minor structural defects can occur.

Adapted from Moore, 1993, the National Organization on Fetal Alcohol Syndrome (NOFAS), 2009, and the Centers for Disease Control (CDC), 2018.<sup>1</sup>

<sup>1</sup>This fetal chart shows the 38 weeks of pregnancy. Since it is difficult to know exactly when conception occurs, health care providers calculate a woman's due date 40 weeks from the start of their last menstrual cycle.

# Effects of alcohol during pregnancy

**Decades of research have shown:**

- Even low levels of alcohol can affect the fetus
- The risk increases with more alcohol

**The healthiest and safest choice is to avoid drinking any alcohol during pregnancy.**



# Every pregnancy is different.

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How alcohol affects the fetus depends on a number of things:

- Genetics
- Pregnant person's diet
- Pregnant person's age
- Pregnant person's substance use
- Amount of alcohol a pregnant person has consumed
- ~~Type of alcohol a pregnant person has consumed~~

# It's All Alcohol

Beer/Lager/Ale  
Kombucha  
Wine: Spritzers/Coolers  
Hard Lemonade/Cider  
Shots/Shooters  
Liqueurs/Modifiers  
Jell-O-shots  
Whipohol  
Boozy Ice Cream  
Snobars  
Powdered Alcohol  
Alcopops



# What's one drink?

Many people are surprised to learn what a standard serving actually looks like.

- Generally, the standard is:
  - 12 ounces for beer,
  - 5 oz for wine and
  - 1.5 oz for distilled spirits
- Alcohol content varies from one beverage to the next



Graphic owned by Proof Alliance





# Binge drinking

Women\*: 4 or more drinks in 2 hours

Men\*: 5 or more drinks in 2 hours



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**True or false:  
only people with  
alcohol use  
disorders are at risk  
of having a child  
with an FASD.**

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# 1 in 7

**Pregnancies in the United States are exposed to alcohol.**

14% of women drank alcohol during pregnancy and 5% engaged in binge drinking.

Source: Denny CH, Acero CS, Naimi TS, Kim SY. Consumption of Alcohol Beverages and Binge Drinking Among Pregnant Women Aged 18–44 Years — United States, 2015–2017. *MMWR Morb Mortal Wkly Rep* 2019;68:365–368.





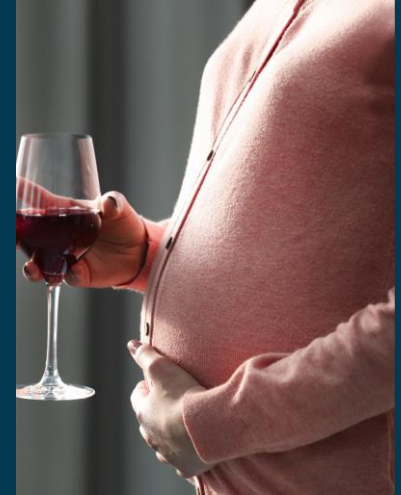
**93%**

of women in North Carolina quit drinking alcohol after they found out they were pregnant.




**7%**

of women in North Carolina continued drinking alcohol after they found out they were pregnant.



**8,628**

This is the estimated number of babies born alcohol exposed annually in North Carolina.



Why would someone  
drink during pregnancy?

# Ending the stigma

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**Prenatal alcohol exposure is a complex public health issue.**

- They drank before they knew they were pregnant
- They didn't know the risks associated with prenatal alcohol exposure
- A healthcare provider gave them wrong information about the risks associated with prenatal alcohol exposure
- They know someone who drank during pregnancy and their child has not been diagnosed with an FASD
- They may have an alcohol use disorder
- They are part of a culture in which drinking alcohol is socially acceptable
- They felt pressure from their partner, family and friends

# Unplanned Pregnancies in NC

## Surprising facts about unplanned pregnancy in North Carolina:

- In 2020, 41% of pregnancies in North Carolina were unplanned.
- 52% of women didn't find out they were pregnant until at least 5 weeks into pregnancy.

Source: North Carolina State Center for Health Statistics. 2020 North Carolina Pregnancy Risk Assessment Monitoring System Survey Results.







**Planned  
pregnancies can  
help prevent FASD.**



## What about the partner's use?

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- There is not enough research yet to decide if a male\* partner's alcohol use can also be unsafe for the fetus.
  - Even so, drinking less or completely giving up alcohol can be a healthy choice for partners.
  - Pregnant people who have a supportive partner are more likely to give up unsafe behaviors like drinking.
  - \*In this case, male refers to someone assigned male at birth.
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# Our Call to Action!

- Let's work together to embed this information into all prevention efforts.
- Take every opportunity to have conversations with all individuals who can become pregnant about alcohol use before and during pregnancy.
- Become an advocate for change as it relates to alcohol policies in your community and state.
- Schedule an FASD Training for your health department!
- Learn more about FASD and how you can support those impacted by visiting [proofalliancenc.org](http://proofalliancenc.org).



**ALCOHOL &  
PREGNANCY  
DON'T MIX.**

**WE HAVE  
THE PROOF.**

**PR%F**  
Alliance NC





**Merry,  
bright and  
empowered  
by the facts.**

Prenatal alcohol exposure is the leading cause of lifelong birth defects, including fetal alcohol spectrum disorders (FASD).

- There is no safe amount of alcohol during pregnancy. [1]
- There is no safe time to drink alcohol during pregnancy. [2]
- There is no safe type of alcohol during pregnancy. [3]

Why are alcohol-free pregnancies so important? They are much safer and healthier for both the baby and the pregnant person. Avoiding alcohol during pregnancy also helps the baby be healthier even after they're born!

Learn the proof at: [PROOFALLIANCE.ORG](https://PROOFALLIANCE.ORG)

## ALCOHOL-FREE DOESN'T HAVE TO BE BORING!

*During pregnancy, enjoy a mocktail!*

### Apple Cider Punch with Cranberries



#### Ingredients:

- 2 cups cranberry juice cocktail
- 4 cups apple cider
- 2 cups ginger ale
- 1 can frozen orange juice

#### How to Make:

- Rim your glass with salt or sugar mixture
- Combine ingredients
- Garnish with lime, apple, orange, &/or cranberry

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Funded by the SAMHSA-SAPTBG 2B08T

## Celebrate an Alcohol-Free Pregnancy with Mocktail Recipes

Proof Alliance NC wants to share these fun alcohol-free drink recipes with you for celebrations year round!



Sources: [1] Flak et al. The association of mid-, moderate, and binge prenatal alcohol exposure and child neuropsychological outcomes: A meta-analysis. *Alcoholism: Clinical and Experimental Research*. 2014; 38(1):74-84.

[2] May PR et al. Maternal alcohol consumption producing fetal alcohol spectrum disorders (FASD), severity, frequency, and timing of drinking. *Drug and Alcohol Dependence*. 2019;193:292-312.

[3] Corales-Guerra L, Miranda R, Gomez-Baya E, Lobo-Lain F. Understanding the relationship between predictors of alcohol consumption in pregnancy: Towards effective prevention of FASD. *Int J Environ Res Public Health*. 2020;17:1388.

**1 IN 7**

In the U.S., at least 1 in 7 pregnancies is exposed to alcohol.

Prenatal alcohol exposure is the leading cause of lifelong birth defects, including fetal alcohol spectrum disorders (FASD). However, FASD is 100% preventable with the right support.

Learn the proof at: [PROOFALLIANCE.ORG](https://PROOFALLIANCE.ORG)

Source: Goldstein LK, Deputy NR Kim SY, Dang EP, Dienny CH. Alcohol consumption and binge drinking during pregnancy among adults aged 18-49 years - United States, 2016-2020. *MMWR Morbidity and Mortality Weekly Rep*. 2022;71(9):19-33

## ALCOHOL-FREE DOESN'T HAVE TO BE BORING!

*During pregnancy, enjoy a mocktail!*

### Blueberry Lavender Lemon Spritz

Recipe by: [@waynesvillesodajerks](https://www.instagram.com/waynesvillesodajerks)

#### Ingredients:

- 1 Lemon
- 1/2 cup fresh blueberries
- 1 bottle of Waynesville Soda Jerks Lavender Lemon Soda

#### How to Make:

- Muddle blueberries
- Combine ingredients
- Garnish with lemon wheel
- Sugar rim glass



NC Department of Health & Human Services |  
Funded by the SAMHSA-SAPTBG 2B08T

## Try more flavors from our friends at Waynesville Soda Jerks!



Waynesville Soda Jerks is a family business which handcrafts artisan sodas made from sustainable and regionally sourced ingredients. It is our mission to create unique and healthy craft sodas that are made with ingredients sourced from farms in the Southern Appalachian region.

We take pride in sourcing our primary ingredients from small farms because of the impact that it has on our local agricultural economy. Our soda flavors highlight the bounty that our region provides including unique combinations such as Apple Rosemary and Blueberry Basil.



# Prevention and Support Resources



Phone: 800.532.6302  
[mothertobaby.org](http://mothertobaby.org)



Alcohol / Drug Council  
of North Carolina

Phone: 800.688.4232  
[alcoholdrughelp.org](http://alcoholdrughelp.org)



202.785.4585  
[fasdunited.org/family-navigator/](http://fasdunited.org/family-navigator/)



[fasdcollaborative.com](http://fasdcollaborative.com)

How'd we do?  
Complete our  
survey to be entered  
into a drawing for a  
\$25 gift card!

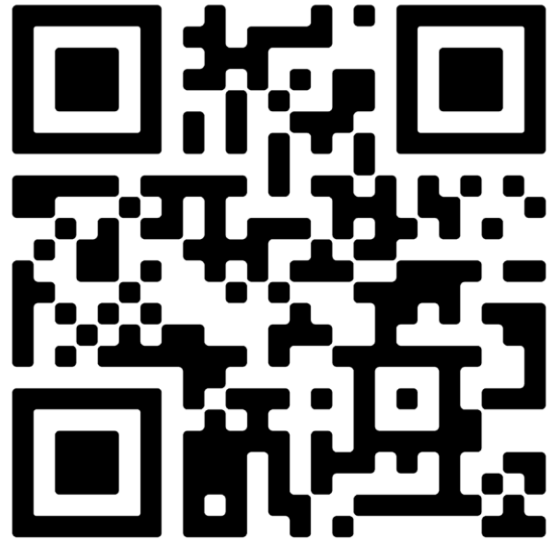
Scan the QR code or visit  
[bit.ly/PANCEvaluation](https://bit.ly/PANCEvaluation)

Website:

[www.proofalliancenc.org](http://www.proofalliancenc.org)

Facebook: @ProofAllianceNC

Twitter: @ProofAllianceNC



SCAN ME



# Nursing and FASD

## Can drinking while nursing cause an FASD?

- Alcohol in breast milk cannot cause FASD
- Alcohol in breast milk **can** impact a baby's sleep patterns, growth and development
- The **safest choice** is to continue not drinking alcohol if breastfeeding
- For more info, talk with your healthcare provider. You can also visit [aap.org](http://aap.org) or [mothertobaby.org](http://mothertobaby.org)



# Sources

- 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>
- American Academy of Pediatrics. Frequently Asked Questions. <https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/fetal-alcohol-spectrum-disorders-toolkit/Pages/Frequently-Asked-Questions.aspx#ques24>
- Astley Hemingway SJ, Bledsoe JM, Davies JK, Brook A, Jirikovic T, Olson EM, Thorne JC. Advances in Pediatric Research1Hemingway et al, 2019 | 5 : 23Twin study confirms virtually identical prenatal alcohol exposures can lead to markedly different fetal alcohol spectrum disorder outcomes- fetal genetics influences fetal vulnerability. *Advances in Pediatric Research*. 2019;5(23).
- 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(9):652-659.
- Canada FASD Research Network. Basic information. <https://canfasd.ca/topics/basic-information/>
- Carmichael Olson H, Montague RA. An innovative look at early intervention for children affected by prenatal alcohol exposure. In: Aduabato SA, Cohen DE, eds. *Prenatal Alcohol Use and FASD: Diagnosis, Assessment and New Directions in Research and Multimodal Treatment*. Bentham Books; 2011.
- Centers for Disease Control and Prevention (CDC). Alcohol and public health: Excessive drinking. <https://www.cdc.gov/alcohol/data-stats.htm>
- Centers for Disease Control and Prevention (CDC). Basics about FASDs. <https://www.cdc.gov/ncbddd/fasd/facts.html>
- Centers for Disease Control and Prevention (CDC). Fact sheets: Binge drinking. <https://www.cdc.gov/alcohol/fact-sheets/binge-drinking.htm>
- Centers for Disease Control and Prevention (CDC). Key findings: Neurobehavioral disorder associated with prenatal alcohol exposure. <https://www.cdc.gov/ncbddd/fasd/features/neurobehavioral-disorder-alcohol.html>
- Centers for Disease Control and Prevention (CDC). Unintended pregnancy. <https://www.cdc.gov/reproductivehealth/contraception/unintendedpregnancy/index.htm>
- Centers for Disease Control and Prevention. Birth Control Methods. <https://www.cdc.gov/reproductivehealth/contraception/index.htm>
- Centers for Disease Control and Prevention. Breastfeeding: Alcohol. <https://www.cdc.gov/breastfeeding/breastfeeding-special-circumstances/vaccinations-medications-drugs/alcohol.html>
- Centers for Disease Control and Prevention. Contraception. <https://www.cdc.gov/reproductivehealth/contraception/index.htm>
- Centers for Disease Control and Prevention. Data and statistics on autism spectrum disorder. <https://www.cdc.gov/ncbddd/autism/data.html>
- Centers for Disease Control and Prevention. FASD Brochure: Final. [https://www.cdc.gov/ncbddd/fasd/documents/fasdbrochure\\_final.pdf](https://www.cdc.gov/ncbddd/fasd/documents/fasdbrochure_final.pdf)
- Centers for Disease Control and Prevention. Fetal Alcohol Spectrum Disorders (FASDs). <https://www.cdc.gov/ncbddd/fasd/alcohol-use.html>
- Centers for Disease Control and Prevention. Folic Acid Helps Prevent Some Birth Defects. <https://www.cdc.gov/features/folicacidbenefits/index.html>
- 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>
- Centers for Disease Control and Prevention. Planning for Pregnancy. <https://www.cdc.gov/preconception/planning.html>
- Chang RC, Wang H, Bedi Y, Golding MC. Preconception paternal alcohol exposure exerts sex-specific effects on offspring growth and long-term metabolic programming. *Epigenetics Chromatin*. 2019;12(1):9.
- Condorelli RA, Calogero AE, Vicari E, La Vignera S. Chronic consumption of alcohol and sperm parameters: our experience and the main evidences. *Andrologia*. 2015;47(4):368-379.
- DD Amendah, SD Grosse, J. Bertrand, Medical expenditures of children in the United States with fetal alcohol syndrome. *Neurotoxicol Teratol*. 2011;33(2):322-4.
- Denny CH, Acero CS, Naimi TS, Kim SY. Consumption of Alcohol Beverages and Binge Drinking Among Pregnant Women Aged 18–44 Years — United States, 2015–2017. *MMWR Morb Mortal Wkly Rep* 2019;68:365–368.

# Sources

- Duke University. How does alcohol get to the fetus. <https://sites.duke.edu/apep/module-5-alcohol-and-babies/content-how-does-alcohol-get-to-the-fetus/>
- Duke University. Understanding FASD: Low self-esteem. <https://sites.duke.edu/fasd/chapter-6-the-fasd-student-and-behavioral-issues/low-self-esteem/>
- 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.
- Fitzpatrick JP, Pestell CF. Neuropsychological Aspects of Prevention and Intervention for Fetal Alcohol Spectrum Disorders in Australia. *Journal of Pediatric Neuropsychology.* 2017;3(1):38-52.
- 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.
- Flak et al. The association of mild, moderate, and binge prenatal alcohol exposure and child neuropsychological outcomes: A meta-analysis. *Alcoholism: Clinical and Experimental Research.* 2014;38(1):214-26.
- Flannigan K, Pei J, Rasmussen C, Potts S, O'Riordan T. A Unique Response to Offenders with Fetal Alcohol Spectrum Disorder: Perceptions of the Alexis FASD Justice Program. *Canadian Journal of Criminology & Criminal Justice.* 2018;60(1):1-33.
- Girault V, et al. Prenatal Alcohol Exposure Impairs Autophagy in Neonatal Brain Cortical Microvessels. *Cell Death & Disease.* 2017; 8(e2610).
- Glass L, Mattson SN. Fetal Alcohol Spectrum Disorders: A Case Study. *J Pediatr Neuropsychol.* 2017;3(2):114-135.
- Glass L, Moore EM, Akshoomoff N, Jones KL, Riley EP, Mattson SN. Academic difficulties in children with prenatal alcohol exposure: Presence, profile, and neural correlates. *Alcoholism: Clinical and Experimental Research.* 2017;41(5):1024-1034.
- Greenmyer JR et al. A multicountry updated assessment of the economic impact of fetal alcohol spectrum disorder: Costs for children and adults. *Journal of Addiction Medicine.*
- Gosdin LK, Deputy NP, Kim SY, Dang EP, Denny CH. Alcohol consumption and binge drinking during pregnancy among adults aged 18–49 years – United States, 2018–2020. *MMWR Morb Mortal Wkly Rep* 2022;71(1):10–13. 2018;12(6):466-473.
- Gross AC, Deling LA, Wozniak JR, Boys CJ. Objective measures of executive functioning are highly discrepant with parent-report in fetal alcohol spectrum disorders. *Child Neuropsychology.* 2015;21(4): 531-538.
- Hanlon-Dearman A, Chen ML, Olson HC. Understanding and managing sleep disruption in children with fetal alcohol spectrum disorder. *Biochem Cell Biol.* 2018 Apr;96(2):267-274.
- Hawaii Department of Health. Strategies for infants and toddlers with an FASD. <http://health.hawaii.gov/fasd/files/2013/09/Strategies-for-Infants-and-Toddlers-Handout-Rev-8-11.pdf>
- Healthline. Birth Defects. <https://www.healthline.com/health/birth-defects>
- Healthy Child Manitoba. Why do girls and women drink alcohol during pregnancy? <https://www.gov.mb.ca/healthychild/fasd/whywomenandgirlsdrink.pdf>
- Hendrickson et al. Cortical gyrification is abnormal in children with prenatal alcohol exposure, *NeuroImage: Clinical.* 2017;15:391-400.
- Kesmodel US, Nygaard SS, Mortensen EL, et al. Are low-to-moderate average alcohol consumption and isolated episodes of binge drinking in early pregnancy associated with facial features related to fetal alcohol syndrome in 5-year-old children? *Alcoholism: Clinical and Experimental Research.* 2019;43:1199-1212.
- Kozanian O, Rohac D, Bavadian N, Corches A, Korzus E, Huffman K. Long-Lasting Effects of Prenatal Ethanol Exposure on Fear Learning and Development of the Amygdala. *Frontiers in Behavioral Neuroscience.* 2018;12:200.
- 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.

# Sources

- Lewis SM, Vydrová RR, Leuthold AC, Georgopoulos AP. Cortical miscommunication after prenatal exposure to alcohol. *Experimental Brain Research*. 2016;234(11):3347-3353.
- Liyanage-Zachariah V, Harding K. Genetic and epigenetic perspectives on the role of fathers in fetal alcohol spectrum disorder. <https://canfasd.ca/wp-content/uploads/sites/35/2019/03/Fathers-Role-1-Issue-Paper-Final.pdf>
- Lupton C, Burd L. and Harwood R. Cost of fetal alcohol spectrum disorders. *American Journal of Medical Genetics*. 2004;127C(671):42-50.
- Masotti P, Longstaffe S, Gammon H, Isbister J, Maxwell B, Hanlon-Dearman A. Integrating care for individuals with FASD: results from a multi-stakeholder symposium. *BMC Health Services Research*. 2015;15(1):1-12.
- May et al. Prevalence of Fetal Alcohol Spectrum Disorders in 4 US Communities, *JAMA*. 2018;319 (5):474-482.
- 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.
- May PA, Gossage JP. Maternal risk factors for fetal alcohol spectrum disorders: not as simple as it might seem. *Alcohol Res Health*. 2011;34(1):15–26.
- MedicineNet. Medical definition of teratogen. <https://www.medicinenet.com/script/main/art.asp?articlekey=11315>
- 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.
- Naimi TS, Lipscomb LE, Brewer RD, Gilbert BC. Binge drinking in the preconception period and the risk of unintended pregnancy: implications for women and their children. *Pediatrics* 2003;111:1136–41.
- North Carolina Department of Health and Human Services. 2016 North Carolina Pregnancy Risk Assessment Monitoring System Survey Results.
- National Down Syndrome Society. Down Syndrome. <https://www.ndss.org/about-down-syndrome/down-syndrome/>
- National Institute on Alcohol Abuse and Alcoholism. Drinking levels defined. <https://www.niaaa.nih.gov/alcohol-health/overview-alcohol-consumption/moderate-binge-drinking>
- National Institute on Alcohol Abuse and Alcoholism. What is a standard drink? [https://www.niaaa.nih.gov/alcohol-health/overview-alcohol-consumption/what-standard-drink?fbclid=IwAR0I3vzJRCgURMSAqTzMqOKWYo9-o5\\_5AZIET8xlqqe8vH\\_OtBECPOrNxzY](https://www.niaaa.nih.gov/alcohol-health/overview-alcohol-consumption/what-standard-drink?fbclid=IwAR0I3vzJRCgURMSAqTzMqOKWYo9-o5_5AZIET8xlqqe8vH_OtBECPOrNxzY)
- National Institute on Alcohol Abuse and Alcoholism. Women and alcohol. <https://www.niaaa.nih.gov/publications/brochures-and-fact-sheets/women-and-alcohol>
- National Institutes of Health, National Institute on Alcohol Abuse and Alcoholism. Fetal Alcohol Exposure. <https://www.niaaa.nih.gov/alcohol-health/fetal-alcohol-exposure>
- Noor S, Milligan ED. Lifelong Impacts of Moderate Prenatal Alcohol Exposure on Neuroimmune Function. *Frontiers in Immunology*. 2018.
- North Carolina Department of Health and Human Services. 2017 North Carolina Pregnancy Risk Assessment Monitoring System survey results.
- O’Leary CM, Bower C. Guidelines for pregnancy: What’s an acceptable risk, and how is the evidence (finally) shaping up? *Drug & Alcohol Review*. 2012;31(2):170-183.
- Office of Women’s Health, U.S. Department of Health and Human Services. Birth Control Methods. <https://www.womenshealth.gov/a-z-topics/birth-control-methods>
- Office on Women’s Health. Staying Healthy and Safe. <https://www.womenshealth.gov/pregnancy/youre-pregnant-now-what/staying-healthy-and-safe>

# Sources

- Pei J, Leung WSW, Jampolsky F, Alsbury B. Experiences in the Canadian criminal justice system for individuals with Fetal Alcohol Spectrum Disorders: Double jeopardy?. *Canadian Journal of Criminology & Criminal Justice*. 2016;58(1):56-86.
- Petrelli B, Weinberg J, Hicks GG. Effects of prenatal alcohol exposure (PAE): insights into FASD using mouse models of PAE. *Biochemistry & Cell Biology*. 2018;96(2):131-147.
- Popova S, et al. Comorbidity of Fetal Alcohol Spectrum Disorder: A Systematic Review and Meta-Analysis. *The Lancet*, 2016;387(10022):5-11.
- Popova S, Lange S, Probst C, Gmel G, and Rehm J. Estimation of National, Regional, and Global Prevalence of Alcohol Use During Pregnancy and Fetal Alcohol Syndrome: A Systematic Review and Meta-analysis. *The Lancet Global Health*. 2017;5(3), e290-e299.
- Rutman D. Becoming FASD Informed: Strengthening Practice and Programs Working with Women with FASD. *Substance Abuse: Research & Treatment*. 2016;10:13-20.
- Sanvisens A, et al. Alcohol consumption during pregnancy: Analysis of two direct metabolites of ethanol in meconium. *International Journal of Molecular Sciences*. 2016;17(417).
- 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.
- Sood et al. Prenatal alcohol exposure and childhood behavior at age 6 to 7 years: I. Dose response effect. *Pediatrics*. 2001;108(2):e34.
- Stanley BC. FAS, FASD: Diagnosis and myths. *J Popul Ther Clin Pharmacol*. 2015;22(1):e106-e107.
- Stephen JM, Kodituwakku PW, Kodituwakku EL, et al. Delays in auditory processing identified in preschool children with FASD. *Alcohol Clin Exp Res*. 2012;36(10):1720-7.
- Subramoney S, Eastman E, Adnams C, Stein DJ, Donald KA. The Early Developmental Outcomes of Prenatal Alcohol Exposure: A Review. *Frontiers in Neurology*. 2018; 9(1108).
- 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.
- Terasaki LS, Schwarz JM. Impact of Prenatal and Subsequent Adult Alcohol Exposure on Pro-Inflammatory Cytokine Expression in Brain Regions Necessary for Simple Recognition Memory. *Brain Sciences* (2076-3425). 2017;7(10):1-16
- Treit et al. Longitudinal MRI reveals altered trajectory of brain development during childhood and adolescence in fetal alcohol spectrum disorders, *Journal of Neuroscience*. 2013;33(24):10098-109.
- 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.
- Tunc-Ozcan, E., et al., Hypothesis: Genetic and epigenetic risk factors interact to modulate vulnerability and resilience to FASD. *Frontiers in Genetics*, 2014. 5(261):1-7.
- U.S. National Library of Medicine, Genetics Home Reference. Spina bifida. <https://ghr.nlm.nih.gov/condition/spina-bifida#statistics>
- University of Rochester. Q&A: Understanding fetal alcohol spectrum disorders. <https://www.rochester.edu/newscenter/qa-understanding-fetal-alcohol-spectrum-disorders/>
- Van Heertum K, Rossi B. Alcohol and fertility: how much is too much?. *Fertil Res Pract*. 2017;3:10.
- Wattendorf AJ, Muenke M. Fetal alcohol spectrum disorders. *Am Fam Physician*. 2005;72(2):279-285.
- Westrup, S. Foetal Alcohol Spectrum Disorders: as prevalent as autism?. *Educational Psychology in Practice*. 2013;29(3):309-325.

# Sources



- Williams JF, Smith VC. Fetal Alcohol Spectrum Disorders. *Pediatrics*. 2015;136(5):e1395-406.
- World Health Organization. Counting the Costs of Drinking Alcohol During Pregnancy. <https://www.who.int/bulletin/volumes/95/5/17-030517/en/>
- Young S, Absoud M, Blackburn C, Branney P, Colley B, Farrag E, & ... Mukherjee R. Guidelines for identification and treatment of individuals with attention deficit/ hyperactivity disorder and associated fetal alcohol spectrum disorders based upon expert consensus. *BMC Psychiatry*. 2016; 16(1):324.
- Zuccolo L, DeRoo LA, Wills AK, et al. Pre-conception and prenatal alcohol exposure from mothers and fathers drinking and head circumference: results from the Norwegian Mother-Child Study (MoBa) [published correction appears in *Sci Rep*. 2017 Apr 24;7:45877]. *Sci Rep*. 2016;7:39535.