FETAL ALCOHOL SPECTRUM DISORDER

A Neurodevelopmental Perspective

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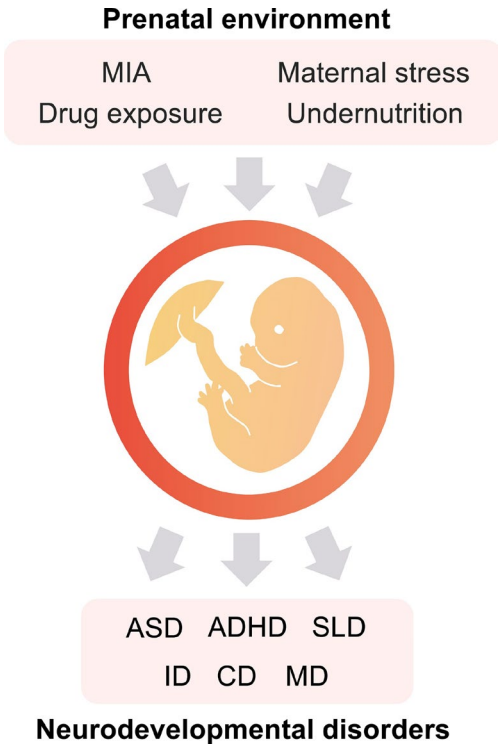
DISCLOSURES

Nothing to Disclose

LEARNING OBJECTIVES

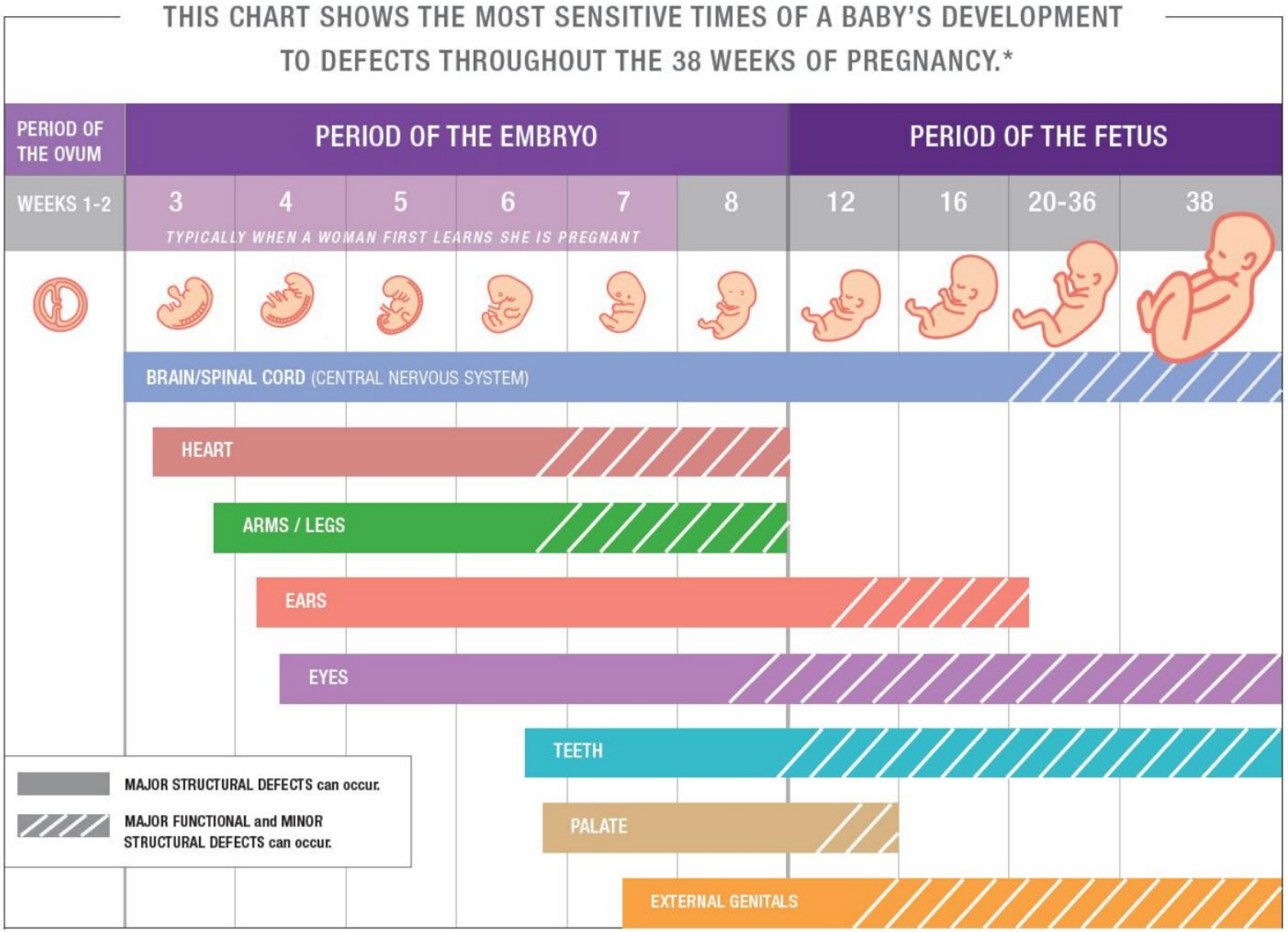
1. Describe brain development in the prenatal period.
2. Understand the impact of prenatal exposures to alcohol on neurodevelopment.
3. Learn some strategies for management.

BACKGROUND



Doi, Ushi, & Shimada, 2022

Many neurodevelopmental disabilities stem from the fetal period when the brain is particularly sensitive to the intrauterine environment.



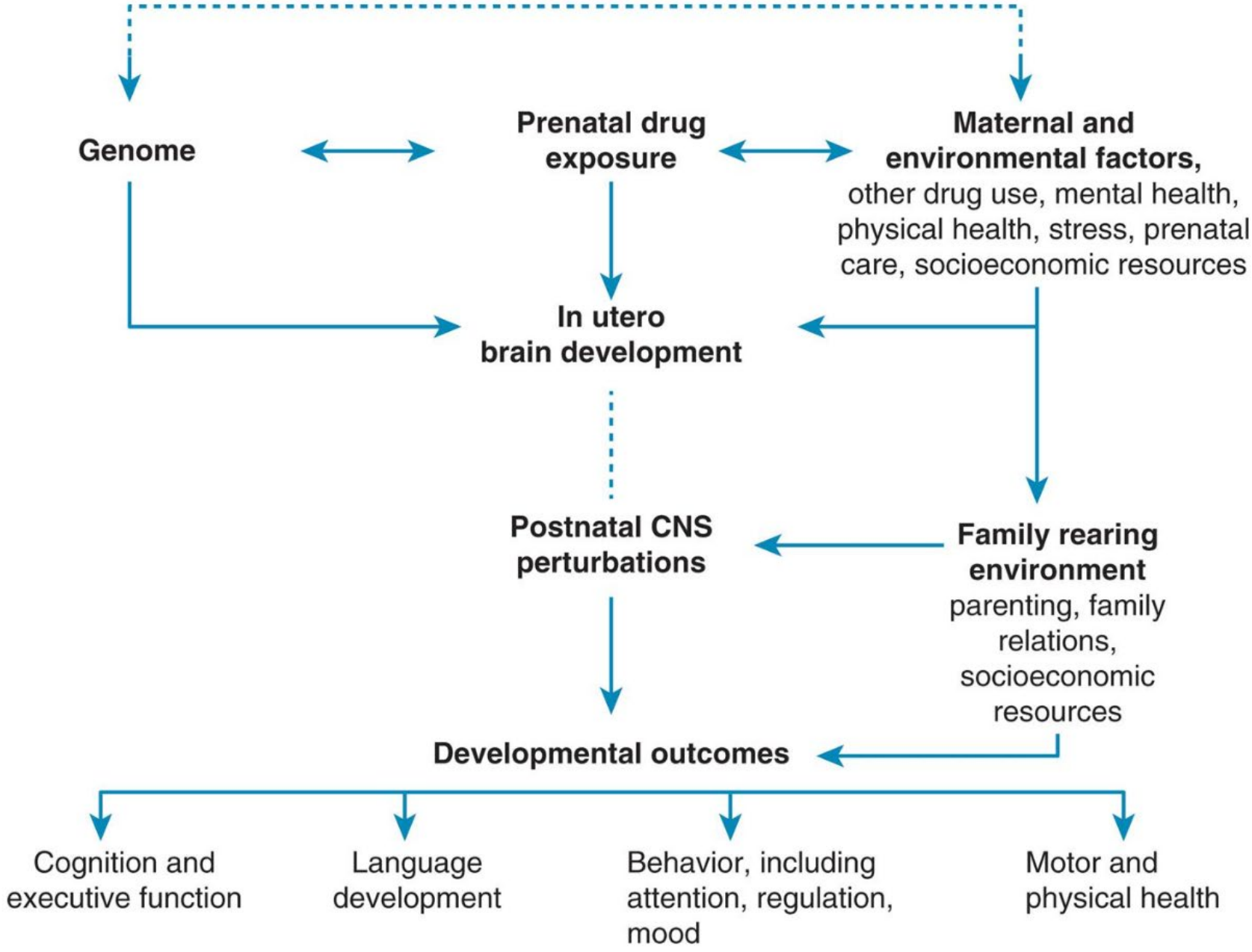
https://mothertobaby.org/fact-sheets/critical-periods-development/

PREDICTORS OF POOR NEURODEVELOPMENTAL OUTCOMES

1. **Susceptibility of the mother and the fetus**

2. **Timing of insult in pregnancy gestation**

3. **Type of insult**
    1. Dose
    2. Extent of Distribution
    3. Number of insults



Volpe's Neurology of the Newborn, 7th Edition

CASE PRESENTATION

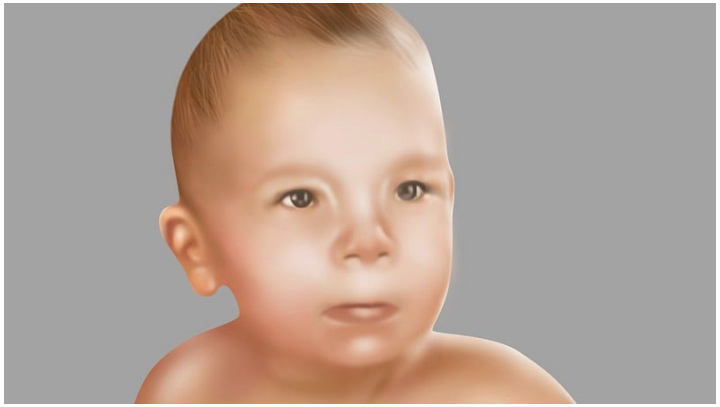


Image obtained from Medscape

- 5-year-old child was exposed prenatally to alcohol, opioids, and marijuana during pregnancy.
- Child placed into foster care
- Child shows developmental delays and hyperactivity which have not been addressed.

FETAL ALCOHOL SPECTRUM DISORDER

- Fetal Alcohol Spectrum Disorder (FASDs) encompass a broad range of defects stemming from prenatal exposure to alcohol.
- Leading preventable cause of developmental disabilities.
- Over 3 million individuals in the U.S. are at risk for an alcohol-exposed pregnancy
- Rate of FASDs in United States school-age children = **1:20**
- Most FASD are *not visible*

Center for Disease Control and Prevention (2023, October 10). Data & Statistics on FASDS.

FETAL ALCOHOL SPECTRUM DISORDER

Fetal Alcohol Syndrome (FAS)

Partial Fetal Alcohol Syndrome (pFAS)

Alcohol Related Birth Defects (ARBD)

Neurobehavioral disorder associated with prenatal alcohol exposure (ND-PAE)

Alcohol Related Neurodevelopmental Disorder (ARND)

DIAGNOSTIC CRITERIA IN FASD

Condition	History of PAE	CNS Deficits	Facial Abnormalities	Growth Deficiencies
Fetal Alcohol Syndrome (FAS)	?	✔	✔	✔
Partial FAS	?	✔	at least one	some
Alcohol-Related Neurodevelopmental Disorder (ARND)	✔	✔ **must show deficits in 3 domains**	none	none
Alcohol Related Birth Defects (ARBD)	✔	none	none	some

Image obtained from https://depts.washington.edu/fasdpn/htmls/fas-face.htm

ND-PAE

Self Regulation	Neurocognitive Functioning	Adaptive Functioning	Prenatal Alcohol Exposure
Mood/Behavior Attention Deficits Impulsivity	Global IQ Learning/Memory Visual-Spatial Executive Functioning	Communication Deficit Social Communication Motor Skills Daily Living Skills	> 13 drinks/month OR > 2 drinks in a single occasion

NEURODEVELOPMENTAL SEQUALAE OF FASD

Cognitive

- Lower IQ scores
- Learning disabilities

Executive Functioning

- Difficulties with planning, organization, cognitive flexibility, shifting, working memory

Language

- Social pragmatics
- Expressive and receptive language

Behavior

- ADHD and ODD are common

Motor

- Fine motor issues
- Tremors, poor coordination, postural imbalance

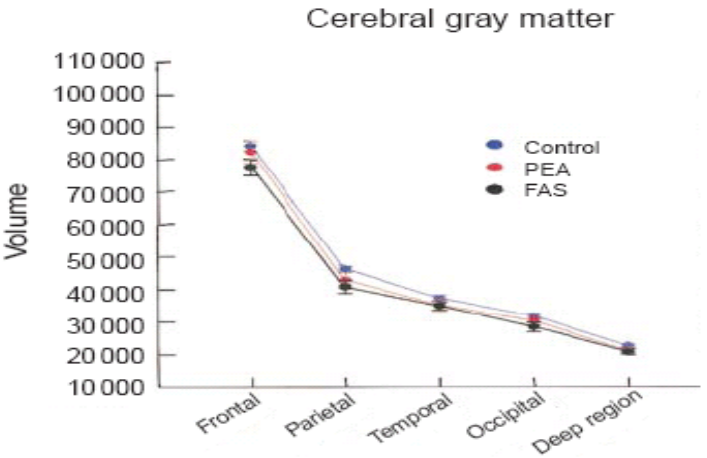
Epilepsy

SECONDARY CHALLENGES IN FASD

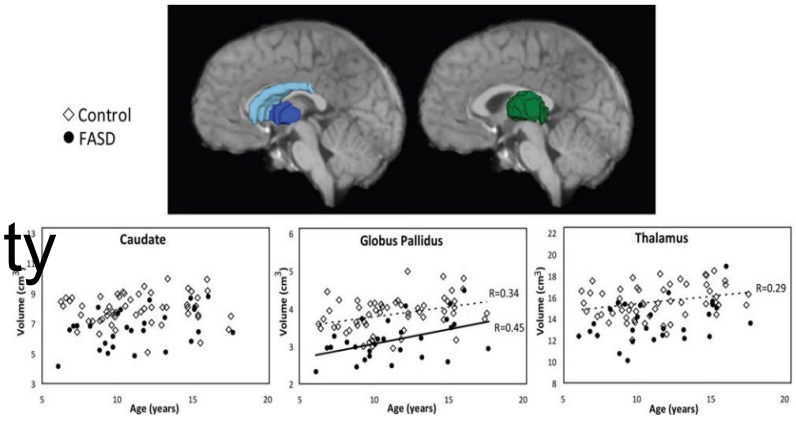
- Mental health issues
- School failure
- Trouble with the law
- Substance use risk

NEUROIMAGING IN FASD

- Global effect of cortical reductions
- Reduced cortical grey matter volumes in frontal, parietal, and temporal cortices **Archibald et al 2001**
- Specific effects on the corpus collosum, cerebellum, basal ganglia **Astley et al., 2009; Mattson et al., 1992; Nardelli et al., 2011**
- Reduced white matter integrity in the frontal and temporal areas and subcortical areas **Sherfab et al., 2019**



Archibald et al., 2001



Nardelli et al., 2001

POLYSUBSTANCE EXPOSURE

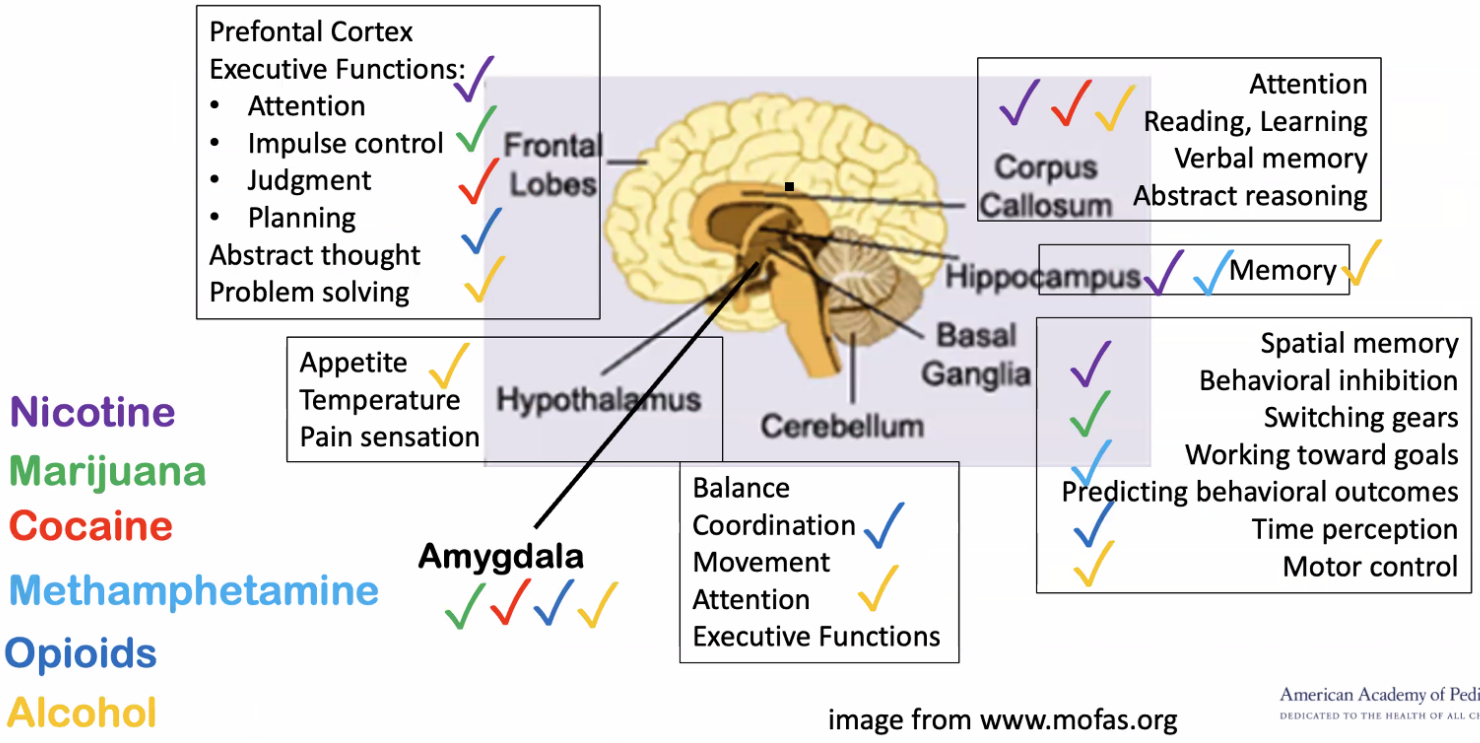


image from www.mofas.org

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PRENATAL ALCOHOL EXPOSURE - PREVENTION

- Pregnant women should be counseled not to drink ANY amount of alcohol during pregnancy, especially in the first 8 weeks of gestation.
- Screening Tools can be used:

Utilize the USAUDIT[1] screening tool to assess a patient for risky alcohol use.

USAUDIT-C*	SCORING							SCORE
	0	1	2	3	4	5	6	
How often do you have a drink containing alcohol?	Never	Less than monthly	Monthly	Weekly	2–3 times a week	4–6 times a week	Daily	
How many drinks containing alcohol do you have on a typical day you are drinking?	1 drink	2 drinks	3 drinks	4 drinks	5–6 drinks	7–9 drinks	10 or more drinks	
How often do you have 4 or more drinks on one occasion?	Never	Less than monthly	Monthly	Weekly	2–3 times a week	4–6 times a week	Daily	
							TOTAL:	

SCORING*: Pregnant: any use | **Non-pregnant:** ≥ 7 pts

Scores are considered positive for identifying risky drinking. Follow up with the full USAUDIT[1] to assess for alcohol use disorders that may require referral to treatment. **Adapted for the ob-gyn audience to only include information on screening women. See footnote[1] for original version.*

1. Babor TF, Higgins-Biddle JC, Robaina K. USAUDIT: the alcohol use disorder identification test, adapted for use in the United States: a guide for primary care practitioners. 2016. [accessed 2017 Dec 10]. https://www.ct.gov/dmhas/lib/dmhas/publications/USAUDIT-2017.pdf

PRENATAL ALCOHOL EXPOSURE - PREVENTION

- Increased attention to correct the nutritional deficiencies in pregnant women (e.g. folate, zinc).
- Early intervention services can help mitigate neurodevelopmental effects.

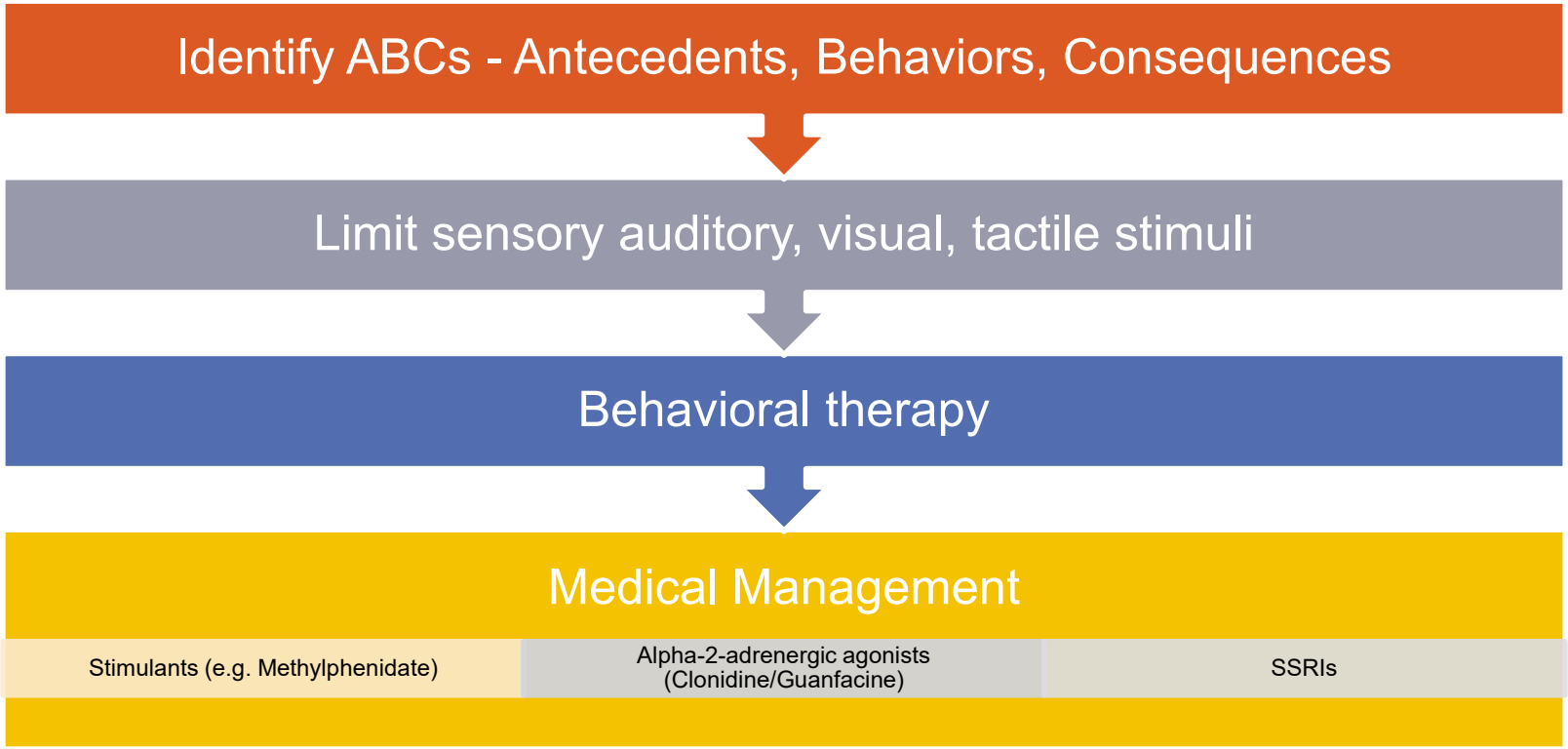
PRENATAL ALCOHOL EXPOSURE - MANAGEMENT

- Interdisciplinary management
- Mental Health/Behavioral services
- Clear communication
- Safety
- Parent support strategies
- FASD evidence-based virtual programs
  - TRIUMPH Through the Challenges of FASD
  - Do2Learn/GoFAR
  - Math Interactive Learning

INTERDISCIPLINARY MANAGEMENT

- Behavioral Psychology
- Occupational Therapy
- Neuropsychology
- Individualized Education Plan
- Psychiatry
- Speech Therapy

PRACTICAL TIPS: BEHAVIORAL MANAGEMENT



❌ Punishment-based approach

✅ Support-based approach

- Teach instead of punish
- Adjust expectations

PRACTICAL TIPS: COMMUNICATION

Recognize that the child's cognitive age is significantly lower than their chronological age

Strategies

Use simple language
Avoid abstractions
Provide material at their level

PRACTICAL TIPS: SAFETY

Close supervision

Risk for seizures

Remove environmental hazards

Risk of wandering and eloping

- Medical alert bracelet
- Locks
- One-on-one aide

PARENT SUPPORT STRATEGIES

- Break tasks into smaller and shorter chunks
- Visual supports
- Repeat instructions
- Maintain predictable routines
- Be patient and consistent
- Advocate for services (e.g. IEP)

SUPPORT GROUPS

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SUMMARY

- Prenatal exposures to alcohol have short-term and long-lasting implications on the structure and function of the developing brain.
- Timing, dosing, and type of exposure is very important in predicting neurodevelopmental outcomes.
- Many of these exposures lead to brain dysfunction, affecting multiple systems and forming the origin of neurodevelopmental disabilities.
- Early intervention helps with outcomes

THANK YOU

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CONTACT INFORMATION

For inquiries and referrals related to the **Neurodevelopmental Clinic for Early Exposures**, please contact:

Amber Huggins(Clinic Coordinator)

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- Phone at **443-923-9150**
- Fax at **667-205-4605**

https://www.kennedykrieger.org/patient-care/centers-and-programs/neurodevelopmental-clinic-for-early-exposures