

Fetal Alcohol Spectrum Disorders

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Epidemiology

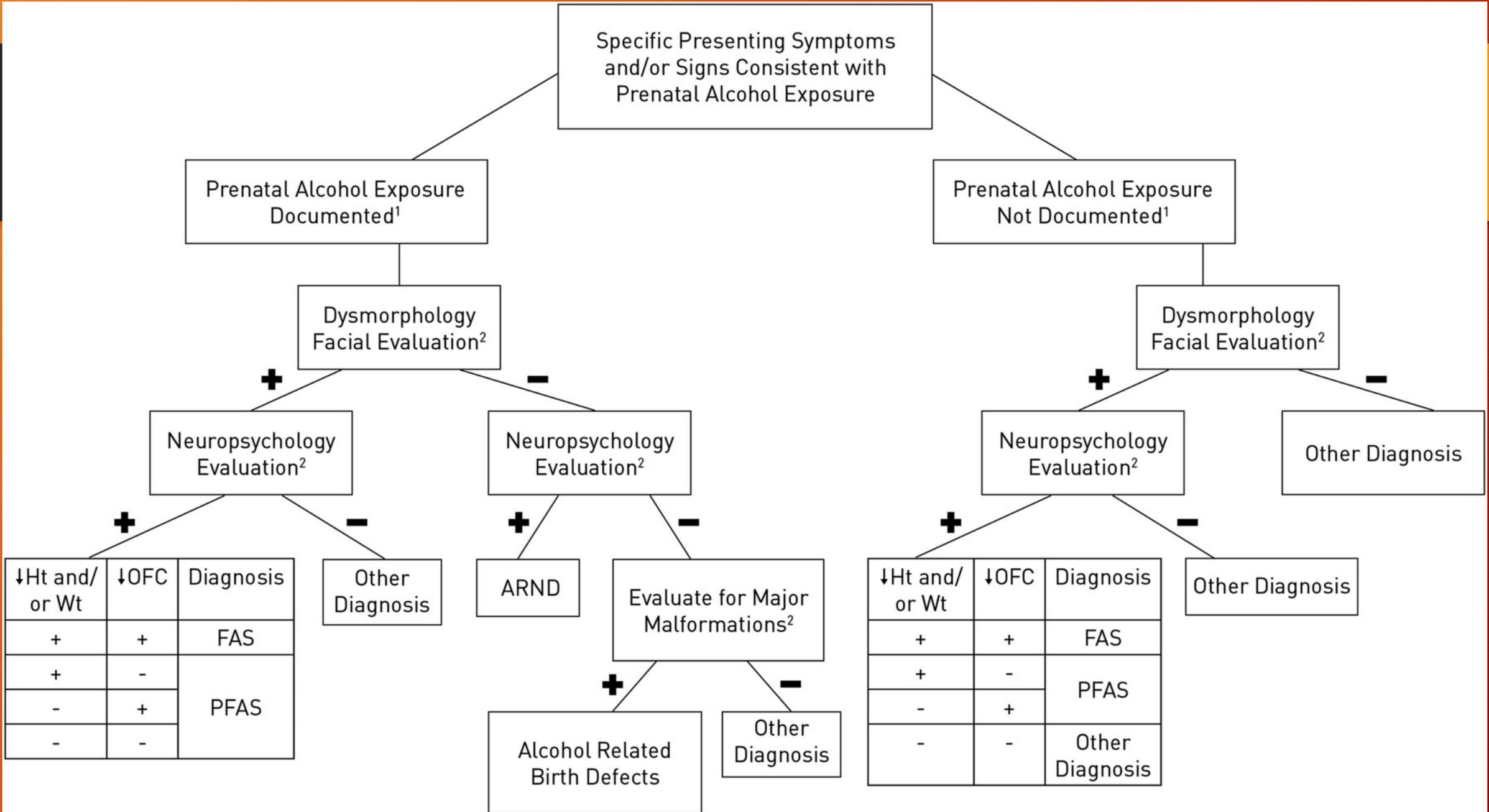
- Most common form of preventable developmental delay and intellectual disability
- Approximately 1/5 women of childbearing age report binge drinking
- 50% of pregnancies are unplanned, prenatal alcohol exposure can occur before a woman knows she's pregnant
- Alcohol can cause irreversible CNS damage leading to CNS dysfunction ranging from mild to severe
- Degree of the effect on newborns is difficult to ascertain, as mothers are, understandably, not forthcoming regarding the degree of alcohol consumption

Epidemiology

- Estimated prevalence is between 2-5%
- Rates of FASDs are reported to be higher in children living in poverty, Native American populations, and those living in foster care
- Estimated lifetime cost of a child with FASD is \$1.4 million
- These children are at high risk of victimization and bullying, thus identification and treatment is imperative

Diagnosis

- Determined based on 3 factors
 - Presence or absence of characteristic facial features
 - Prenatal/postnatal growth deficiency
 - CNS problems
- Known maternal alcohol consumption during pregnancy is not always necessary
 - ≥ 6 drinks/wk for ≥ 2 wks during pregnancy
 - ≥ 3 drinks per occasion ≥ 2 occasions during pregnancy
 - Documentation of intoxication during pregnancy



Specific Presenting Symptoms and/or Signs Consistent with Prenatal Alcohol Exposure

Prenatal Alcohol Exposure Documented¹

Prenatal Alcohol Exposure Not Documented¹

Dysmorphology Facial Evaluation²

Dysmorphology Facial Evaluation²

Neuropsychology Evaluation²

Neuropsychology Evaluation²

Neuropsychology Evaluation²

Other Diagnosis

↓Ht and/or Wt	↓OFC	Diagnosis
+	+	FAS
+	-	PFAS
-	+	
-	-	Other Diagnosis

Other Diagnosis

ARND

Evaluate for Major Malformations²

Alcohol Related Birth Defects

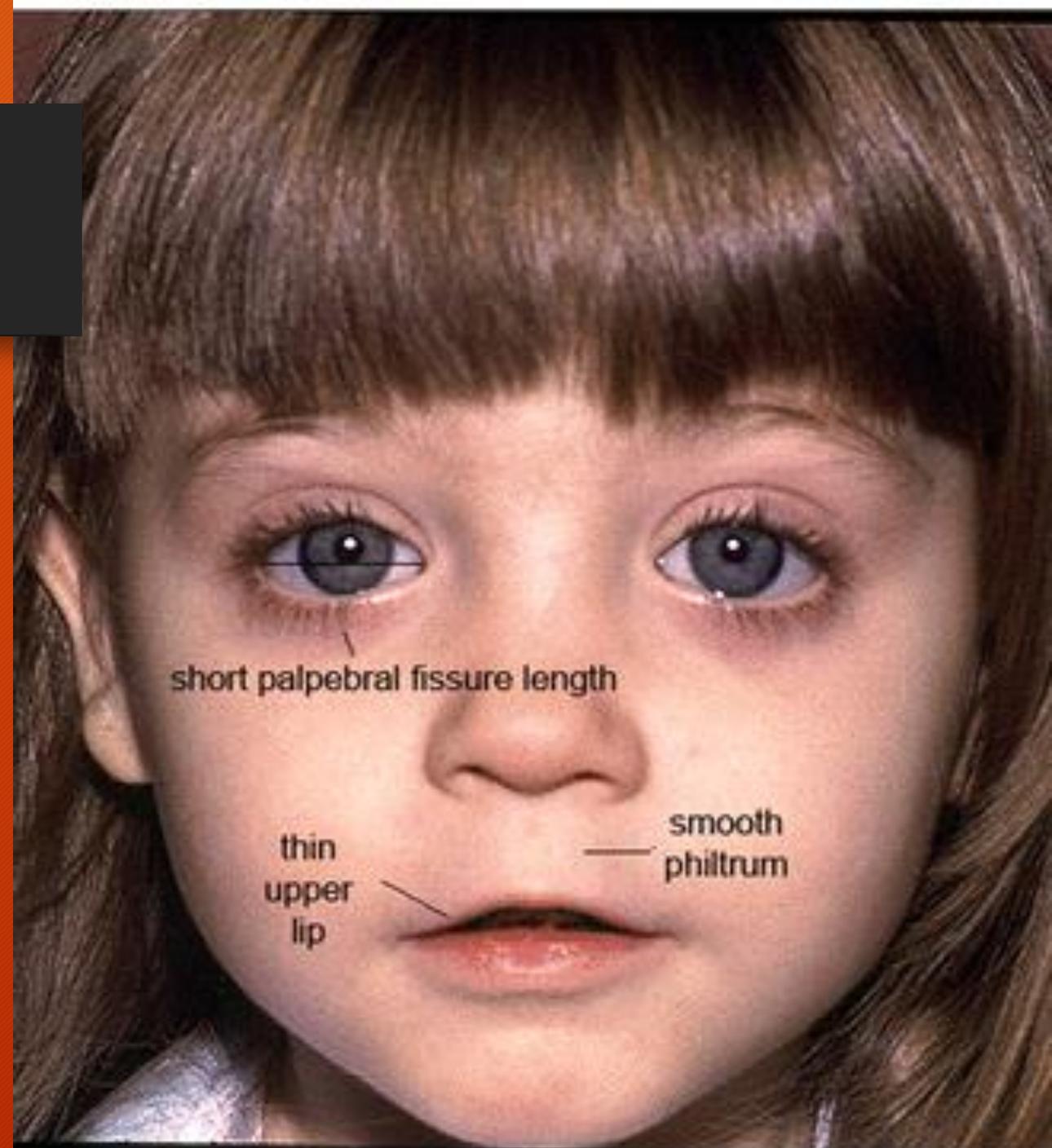
Other Diagnosis

↓Ht and/or Wt	↓OFC	Diagnosis
+	+	FAS
+	-	PFAS
-	+	
-	-	Other Diagnosis

Other Diagnosis

Characteristic facial features

- Smooth ridge between the nose and upper lip (smooth philtrum)
- Thin upper lip
- Short distance between the inner and outer corners of the eyes, giving the eyes a wide-spaced appearance.



Growth Deficiency

- Typically have height, weight, or both $\leq 10^{\text{th}}$ percentile
 - Growth issues may occur before birth
 - Some growth problems resolve in early life

CNS Difficulties (≥ 3 of following)

- Cognitive Deficits or developmental delays
 - Can specifically be math related
- Executive functioning deficits
 - poor organization and planning, lack of inhibition, difficulty grasping cause and effect, difficulty following multistep directions, difficulty doing things in a new way or thinking of things in a new way, poor judgment, and inability to apply knowledge to new situations
- Motor functioning delays
 - delay in walking (gross motor skills), difficulty writing or drawing (fine motor skills), clumsiness, balance problems, tremors, difficulty coordinating hands and fingers (dexterity), and poor sucking in babies
- Attention problems or hyperactivity
- Problems with social skills
 - might lack a fear of strangers, be easily taken advantage of, prefer younger friends, be immature, show inappropriate sexual behaviors, and have trouble understanding how others feel.
- Other CNS issues

FAS with confirmed maternal exposure

FAS without confirmed maternal exposure

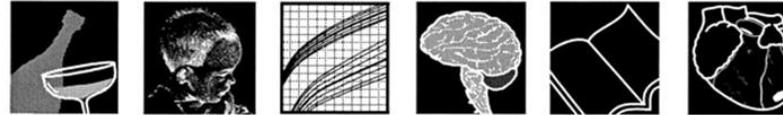
Partial FAS with confirmed exposure

Alcohol-related birth defects (ARBD)[†]

Alcohol-related neurodevelopmental disorder (ARND)[†]

		OR	OR	OR	

A Confirmed Exposure to Alcohol
 B Facial Anomalies
 C Growth Retardation
 D CNS Abnormalities
 E Cognitive Abnormalities
 F Birth Defects



*Adapted from *Fetal Alcohol Syndrome: Diagnosis, Epidemiology, Prevention, and Treatment*. 1996;4-5. Letter designations in the figure indicate the following:

A. Confirmed maternal alcohol exposure indicates a pattern of excessive intake characterized by substantial, regular intake or heavy episodic drinking. Evidence of this pattern may include frequent episodes of intoxication, development of tolerance or withdrawal, social problems related to drinking, legal problems related to drinking, engaging in physically hazardous behavior while drinking, or alcohol-related medical problems such as hepatic disease.

B. Evidence of a characteristic pattern of facial anomalies that includes features such as short palpebral fissures and abnormalities in the premaxillary zone (eg, flat upper lip, flattened philtrum, and flat midface).

C. Evidence of growth retardation, including at least one of the following:
 • low birth weight for gestational age
 • decelerating weight over time not caused by nutrition
 • disproportional low weight to height

D. Evidence of CNS neurodevelopmental abnormalities, including at least one of the following:
 • decreased cranial size at birth
 • structural brain abnormalities (eg, microcephaly, partial or complete agenesis of the corpus callosum, cerebellar hypoplasia)
 • neurological hard or soft signs (as age appropriate), such as impaired fine motor skills, neurosensory hearing loss, poor tandem gait, poor eye-hand coordination

E. Evidence of a complex pattern of behavior or cognitive abnormalities that are inconsistent with developmental level and cannot be explained by familial background or environment alone, such as learning difficulties; deficits in school performance; poor impulse control; problems in social perception; deficits in higher level receptive and expressive language; poor capacity for abstraction or metacognition; specific deficits in mathematical skills; or problems in memory, attention, or judgment.

F. Birth defects associated with alcohol exposure include:

Cardiac	Atrial septal defects Ventricular septal defects	Aberrant great vessels Tetralogy of Fallot
Skeletal	Hypoplastic nails Shortened fifth digits Radioulnar synostosis Flexion contractures Camptodactyly	Clinodactyly Pectus excavatum and carinatum Klippel-Feil syndrome Hemivertebrae Scoliosis
Renal	Aplastic, dysplastic, hypoplastic kidneys Horseshoe kidneys	Ureteral duplications Hydronephrosis
Ocular	Strabismus Retinal vascular anomalies	Refractive problems secondary to small globes
Auditory	Conductive hearing loss	Neurosensory hearing loss
Other	Virtually every malformation has been described in some patient with FAS. The etiologic specificity of most of these anomalies to alcohol teratogenesis remains uncertain.	

[†]Alcohol-related effects indicate clinical conditions in which there is a history of maternal alcohol exposure, and where clinical or animal research has linked maternal alcohol ingestion to an observed outcome. There are two categories, alcohol-related neurodevelopmental disorder and alcohol-related birth defects, which may co-occur. If both diagnoses are present, then both diagnoses should be rendered.

Frequent Co-Morbid Conditions

- ADHD
- ODD and Conduct Disorder
- Anxiety Disorder
- Adjustment Disorders
- Sleep disorders

Interventions and Management

- Typically tailored to the individual patient
- Medications can be utilized to treat mood and psychiatric disorders
- Individualized therapy is utilized for developmental delay, difficulties with executive functioning, and adaptive skills

References

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