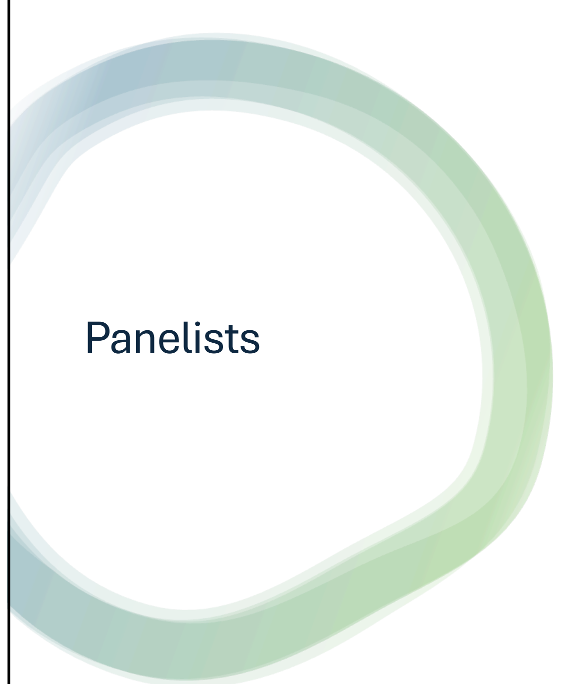
1



Denise Bothe, MD
UH Rainbow Babies & Children's Hospital / Case Western Reserve University School of Medicine

Roxanne Chang, MD
Harbor-UCLA Pediatrics/ David Geffen School of Medicine at UCLA

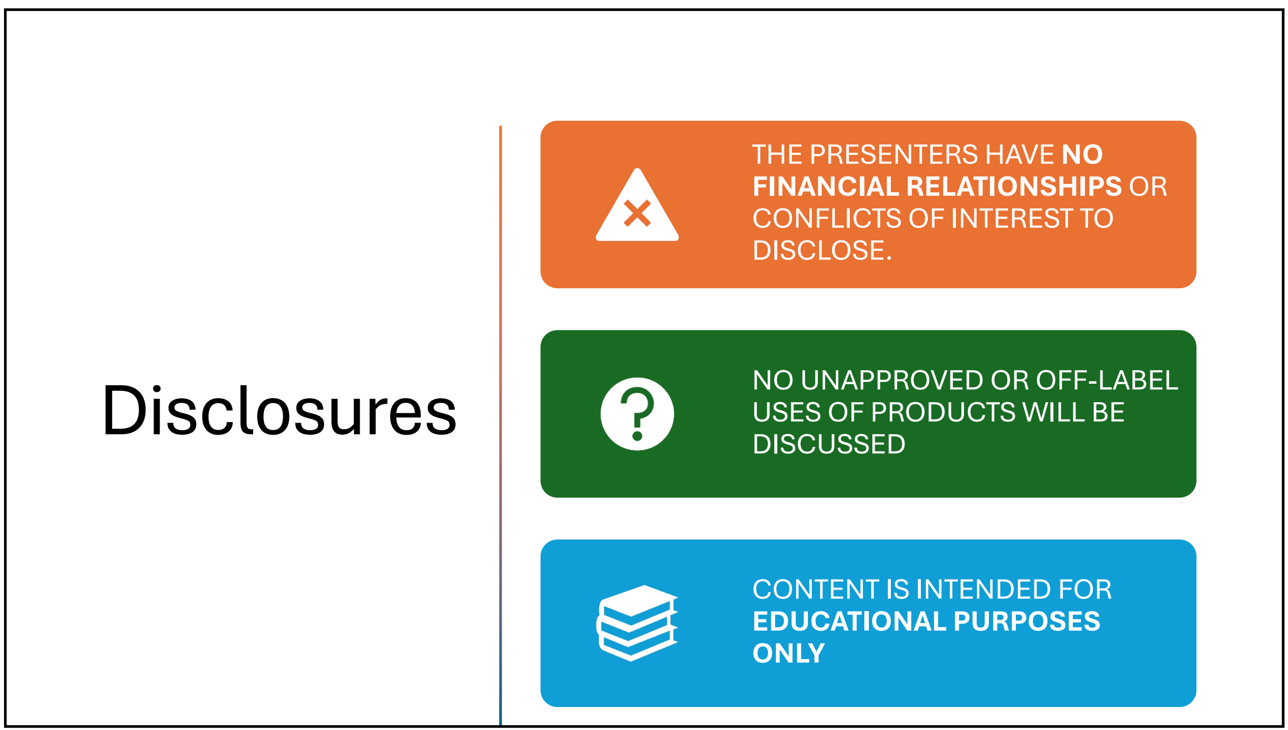
Kimberly Burkhart, PhD
UH Rainbow Babies & Children's Hospital / Case Western Reserve University School of Medicine

Catherine Lipman, MD
Cleveland Clinic Children's Hospital/ Cleveland Clinic Lerner College of Medicine of Case Western Reserve University School of Medicine

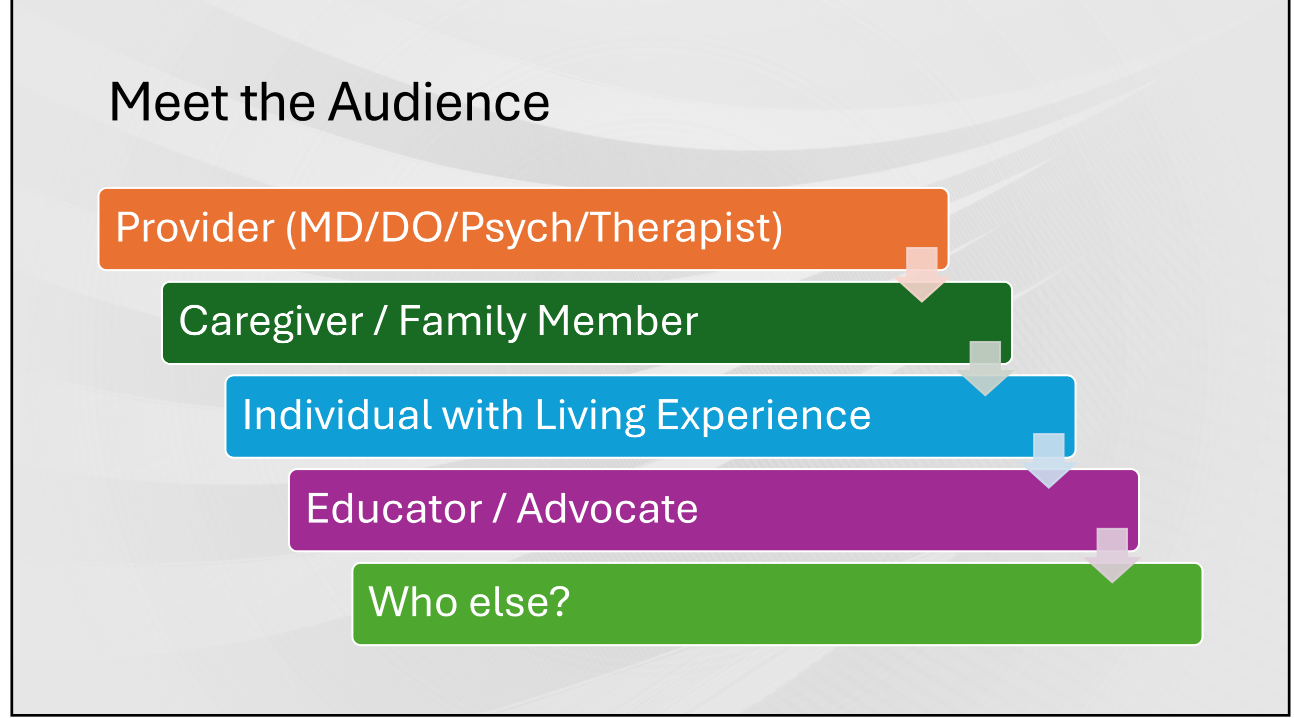
Yasmin Senturias, MD
Atrium Health–Levine Children's Hospital / Wake Forest School of Medicine

Tanaporn Jasmine Wilaisakditipakorn, MD
UC Davis, MIND Institute

2



3

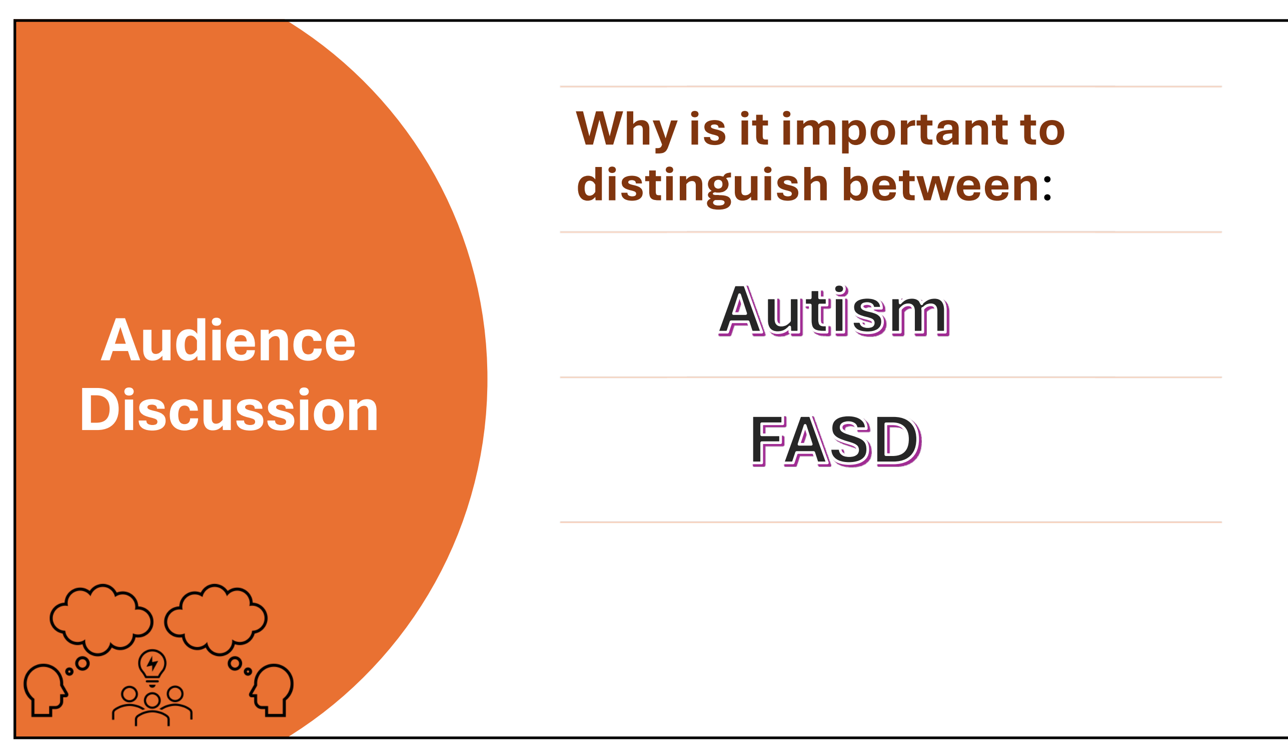


4

Objectives

Distinguish	social, neurocognitive, and adaptive profiles of FASDs and ASD across development
Identify	effective adolescent interventions for FASDs, ASD, or both
Strengthen	communication approaches with families, schools, and teen

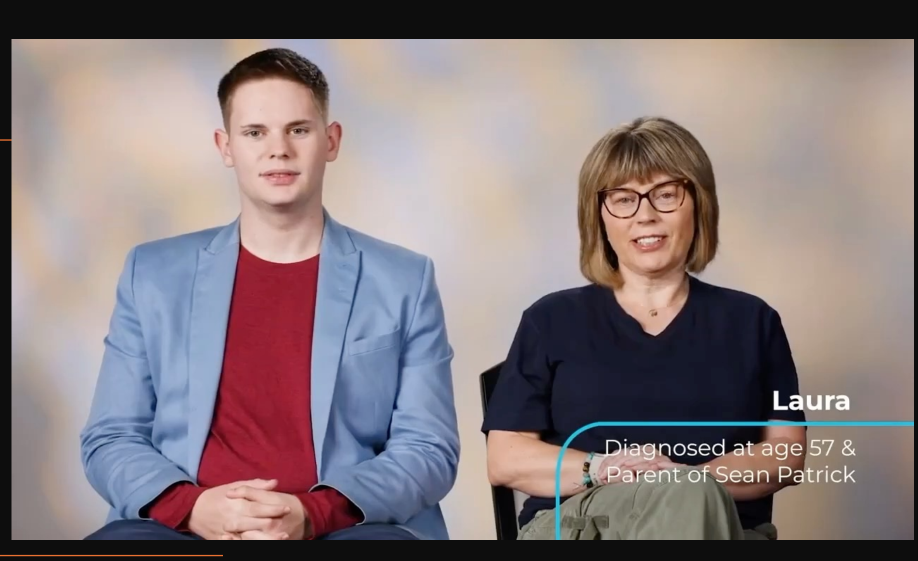
5



6

Sean Patrick & Laura

- Sean Patrick dx as teen
  - Dx w ASD X 3
- Mother Laura dx age 57
- https://www.cdc.gov/fasd/stories/video-series.html



7

Why Differentiation Matters

- **Treatment:** Interventions differ
- **Self-Understanding:** A teen's identity depends on knowing *how* their brain works.
- **Advocacy:** Getting the right services in school and community.
- **Anticipatory Guidance:** Planning for adulthood.

8

Prevalence GENERAL population:
ASD vs FASD

FASD

1 in 20

ASD

1 in 31

9

Prevalence

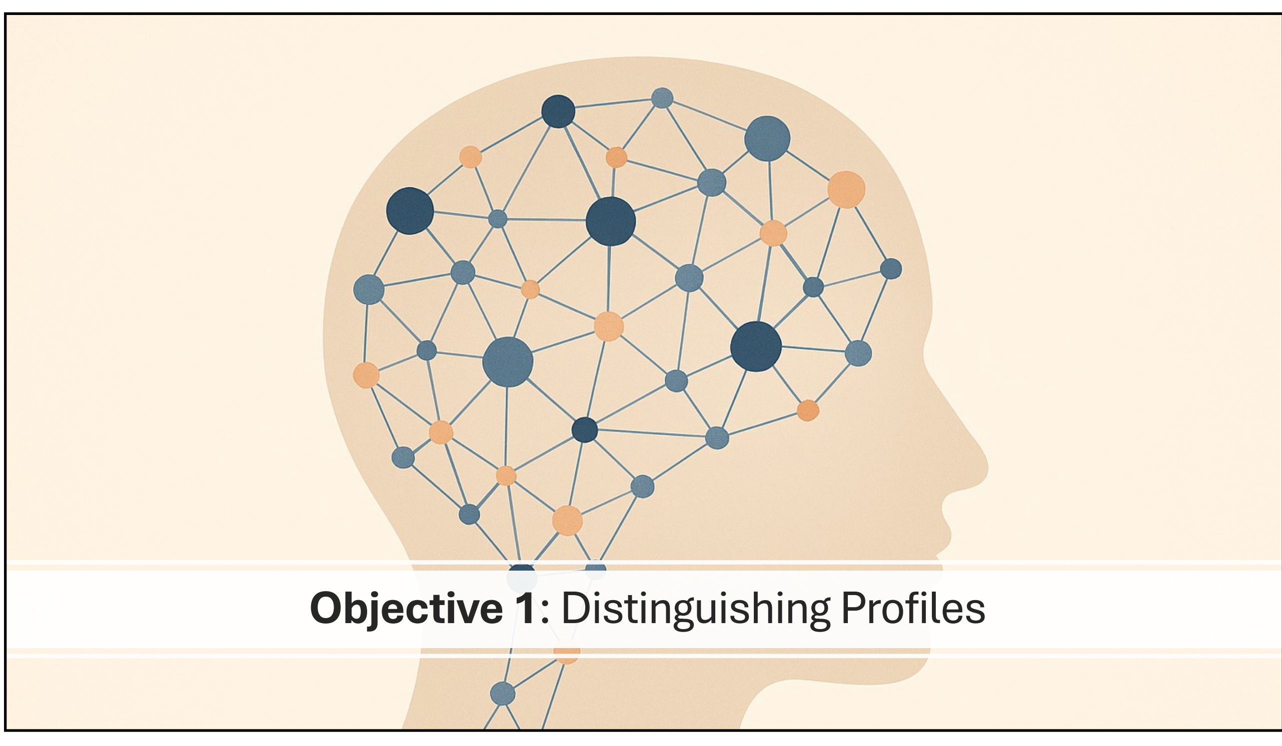
A meta-analysis found the prevalence of ASD among children with FASD is 2.6%.

Lange, et al. 2018

A pilot study of children in an FASD clinic in Canada reported a prevalence of ASD of 4.1%

Young, et al. 2018

10



11

Overlapping Symptoms

Autism Spectrum Disorder DSM-5-TR

A. Social Communication Differences
- Social reciprocity
- Nonverbal communication
- Relationships

B. Restricted / Repetitive Patterns
- Insistence on sameness
- Restricted interests
- Sensory processing differences
- Repetitive motor movements

Shared Features
- Social immaturity
- Poor social understanding
- Pragmatic language weaknesses
- Emotional dysregulation
- Inattention
- Hyperactivity
- Rigidity / inflexibility
- Sensory dysregulation

Fetal Alcohol Spectrum Disorders

Fetal alcohol exposure

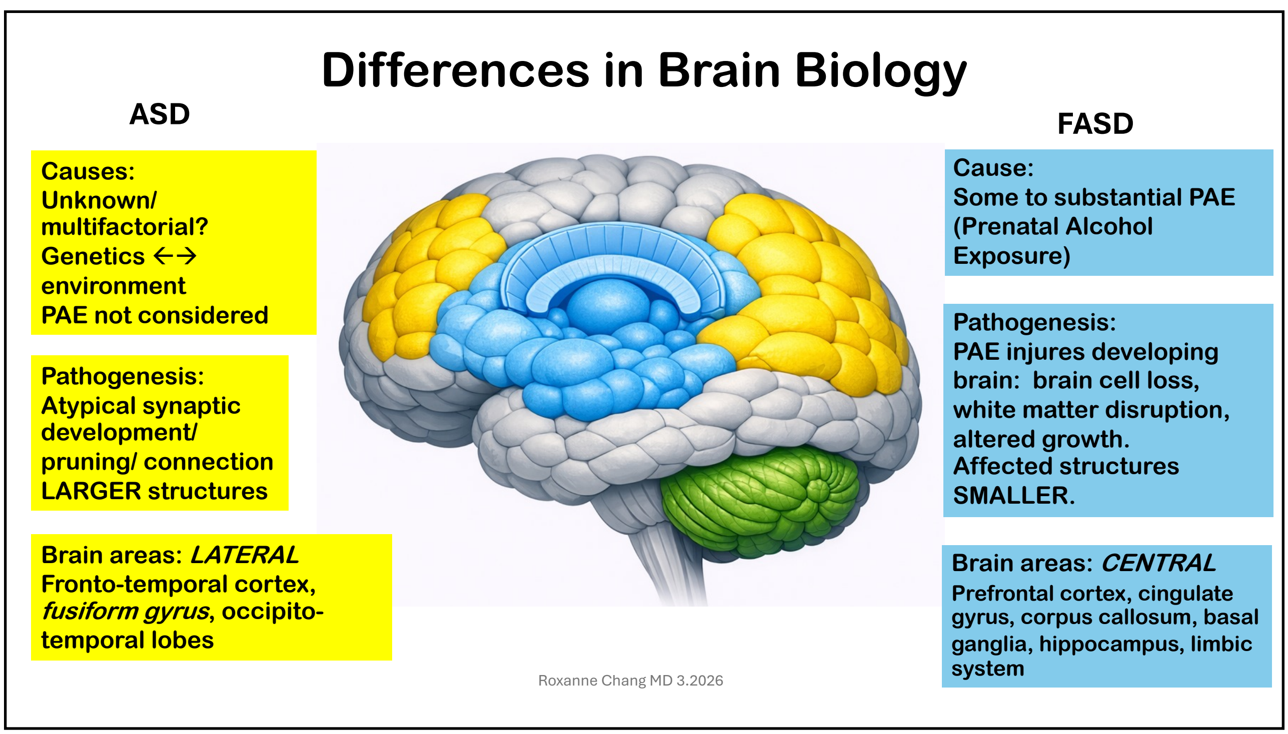
Adaptive Skills Deficits

Self-regulation difficulties: neurobehavioral emotional dysregulation

Developmental Differences: primary neurocognitive difficulties
- Executive dysfunction
- Memory
- Cause-effect reasoning

Roxanne Chang MD 2.2026

12



13

Differences in Thinking/ Reasoning

Domain	Autism Spectrum Disorder (ASD)	Fetal Alcohol Spectrum Disorders (FASD)
Play	Restricted, repetitive, inflexible play; reduced symbolic play	Appropriate play themes but immature.
Executive Functioning	Variable; not universally impaired	Significant deficits - core impairment
Working Memory	Not typically the central deficit	Significant deficits - core impairment
Visual–Spatial Processing	Often a relative strength	Frequently impaired
Behavioral Regulation	From rigidity, communication limits, sensory issues	Marked mood and behavioral dysregulation (especially for communication skills)
Cognitive Rigidity	Core feature	Present but context-dependent
Repetitive Behaviors	Common, may be complex (motor stereotypies, echolalia)	None to simple motor patterns
Sensory Processing	Extreme sensitivities common	Sensory sensitivities common but variable

Stevens 2013; Bishop 2007; Carpita 2022; Fernandez-Magalhaus 2025

Roxanne Chang MD 12.2025

14

Differences in Social Communication

Domain	Autism Spectrum Disorder (ASD)	Fetal Alcohol Spectrum Disorders (FASD)
Social Interest	Core impairment - Usually **low/ atypical**.	**Normal to high**. Often overfriendly.
Social Reciprocity	Core impairment – Fundamental impairment, independent of language.	Generally intact, impaired by language & cognition.
Language Profile	Receptive language often >> expressive	Expressive often > receptive (atypical)
Nonverbal Communication	Core impairment - gesturing, eye contact, and body language.	Gestures and body language generally intact
Social Cues	Difficulty detecting subtle social cues	Detect cues but frequently misinterprets them
Theory of Mind: Perspective Taking	Core difficulty	Present, applied inconsistently
Social Cognition	Markedly impaired; often well below global IQ	Closer to global IQ, applied inconsistently
Peer Relationships	Few friendships; social isolation common	Makes friends but unstable; gullible
Across settings	Generally consistent	High variability

Stevens 2013; Bishop 2007; Carpita 2022

Roxanne Chang MD 12.2025

15

A 15-year-old boy

- History of alcohol exposure before birth
- Facing several challenges that have become more of an issue since starting high school.

Strengths

- Loves being with friends and connecting with them
- Is kind and a helper in the class
- Likes to play basketball and is a great singer

Challenges

- Impulsivity,
- Trouble with the "give-and-take" of conversation
- Struggling to follow long lists of instructions
- Difficulty keeping up with schoolwork and chores
- Easily manipulated or taken advantage of by peers
- Gets into arguments quickly
- Struggles with making safe or logical choices

16

Evaluation

- Caregiver interview
- Child interview/observations
- Cognitive (tests evaluating verbal comprehension, perceptual reasoning, visual-spatial skills, working memory, and processing speed)
- Achievement (tests evaluating how much students have learned in specific academic areas – math, reading, written expression)
- Executive functioning (tests evaluating cognitive flexibility and problem solving skills; rating scales assessing inhibition, shifting, emotional control and self-restraint)
- Social skill functioning (observation/ADOS-2; parent/teacher questionnaires)
- Behavioral functioning (observation; parent/teacher/self-questionnaires)
- Emotional functioning (parent/teacher/self-questionnaires)
- Adaptive functioning (Vineland or ABAs)

17

Evaluation Results

SRS (Social Responsiveness Scale); High score
He has difficulty with social interactions

ADOS- 2 (Autism Diagnostic Observation Schedule); score not consistent with autism
When he is tested one on one, he does not have autism symptoms consistent with a diagnosis.

Cognitive testing (i.e IQ testing) : Low scores in

Working memory (trouble holding info)	Processing speed (takes longer to think)	Cognitive flexibility (hard to "switch gears")

18

Questions for small groups

- What would you diagnose this teenager with?
- What underlying difficulties could be contributing to his social struggles?
- Are his social struggles related to difficulty initiating interactions or difficulty maintain appropriate interactions?
- What intervention strategies might help him?

19

Take Home Points

He has **autistic-like behaviors**, but his difficulties with social interactions are caused by how his brain manages information, rather than a lack of social understanding.

20

Take Home Points

He has **autistic-like behaviors**, but his difficulties with social interactions are caused by how his brain manages information, rather than a lack of social understanding.

His autistic-like behaviors are due to **specific brain-processing gaps**.

21

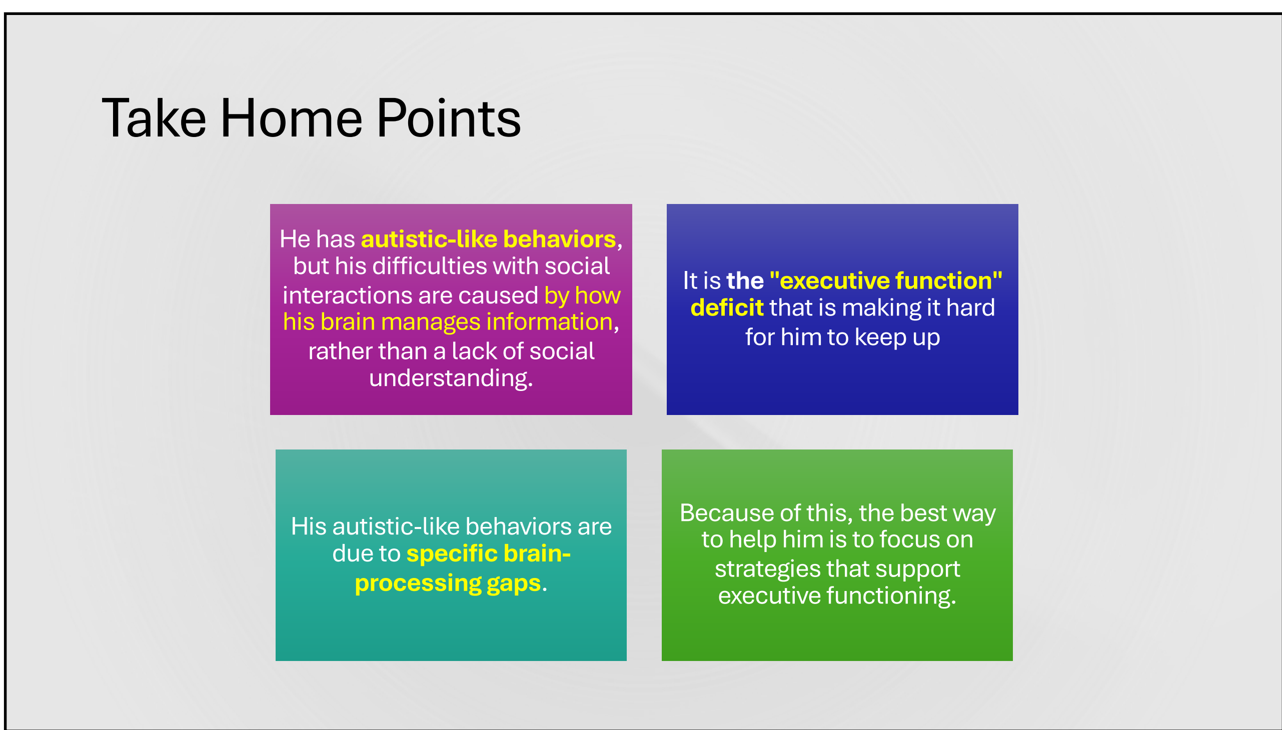
Take Home Points

He has **autistic-like behaviors**, but his difficulties with social interactions are caused by how his brain manages information, rather than a lack of social understanding.

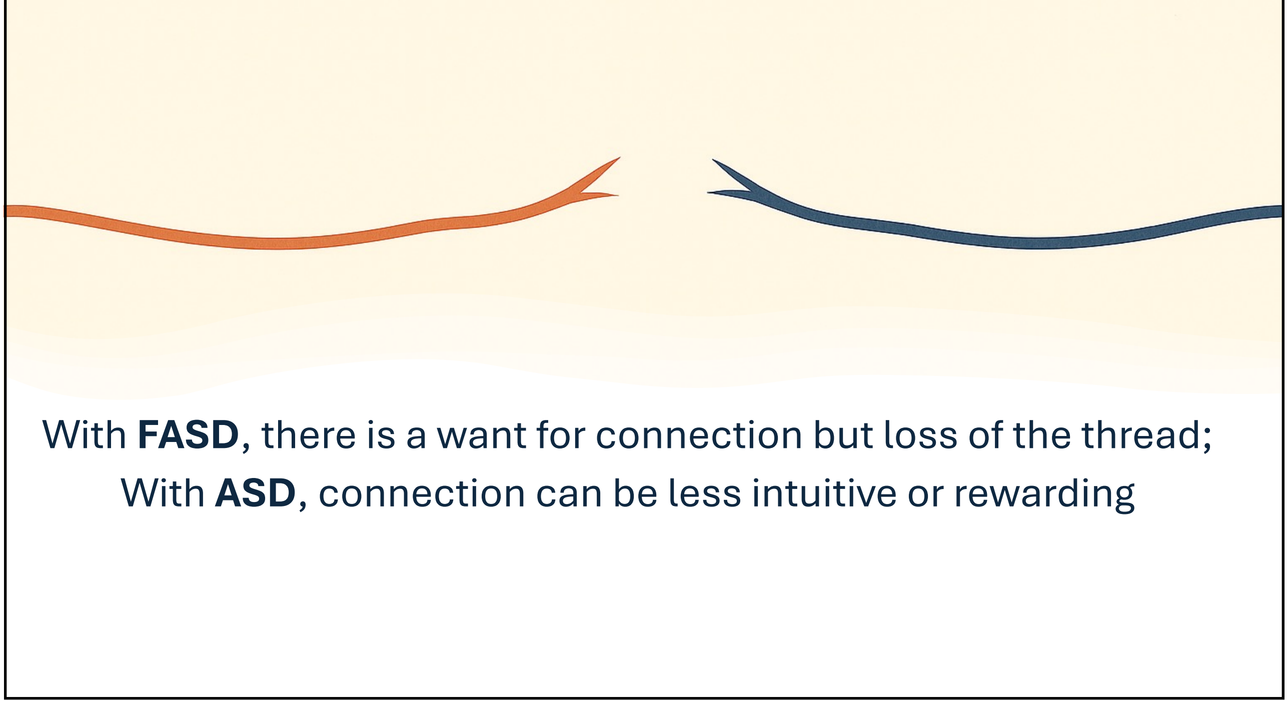
It is **the "executive function" deficit** that is making it hard for him to keep up

His autistic-like behaviors are due to **specific brain-processing gaps**.

22



23



24

25

Empirically-Supported Interventions

ASD	FASD
Applied Behavior Analysis	Families Moving Forward; Family Foundations: B.E.S.T. Program
Behavioral/cognitive-behavioral Therapy (e.g. BIACA)	Behavioral/cognitive-behavioral therapy
Social skills groups (e.g. PEERs Program)	Social skills groups (Good Buddies)
Parent-mediated intervention (e.g. RUBI)/parent management training	Parent management training
Zones of Regulation	Zones of Regulation
Speech/language therapy (e.g. social pragmatics)	Math Interactive Learning Experience
Occupational therapy	Occupational therapy
	GoFAR

26

Statistics at Transition to Adulthood with FASD

- Mental health disorders ~ 90% of individuals compared to approximately 30% in the general population
- 63% require independent living support
- 37% experience employment problems
- 38% alcohol misuse
- 46% other substance misuse
- 30% have legal problems
- 21% require assisted or sheltered housing

  - McLachlan K, et al. 2020
  - Wozniak JR, et al. 2019

27

Evidence Gap for Adult Interventions

- **Critical lack of interventions specifically designed for adolescents and adults** with FASD.
- 2 Systematic reviews found for FASD interventions "across the lifespan"

  Reid et al. 2015 included 32 studies - FASD interventions across the entire lifespan.
  - Evidence that parents and caregivers could benefit from support with child behavior.
  - Support for education and advocacy for parents/caregivers, teachers, or child welfare workers.
  - majority targeted **early to middle childhood but notable absence of research in adolescents and adults**

  Flannigan et al. 2020 reviewed 33 studies with interventions to improve **mental health and substance use outcomes**
  - Most focused on **building foundational skills and strategies**
  - **Notable lack of interventions directly targeting mental health and substance use challenges** despite individuals with FASD experiencing remarkably high rates of these problems beginning early in life and extending throughout adulthood.

28

FASD and the Transition to Adulthood: A Critical Drop-Off in Services

- **Marked decline in interventions and supports** as children transition into adolescence and young adulthood
- **Loss of:**
  - School-based services and mandated supports
  - Therapy intensity and care coordination
  - Eligibility for pediatric specialty programs
- Increased expectations for independence **without parallel supports**
- Families and individuals often face:
  - Fragmented adult systems
  - Limited provider expertise in neurodevelopmental conditions – lack of access for comprehensive assessment
  - Gaps in behavioral, mental health, and vocational/employment training and supports
  - Limited housing/independent living supports/services
  - Difficulties navigating legal system for their adolescent or adult with FASD

29

Feature	ASD	FASD
Primary neurodevelopmental driver	Core social-communication differences	Brain-based executive dysfunction and self-regulation impairment
Evidence base for ABA	Substantial evidence for skill acquisition when individualized	No robust evidence for standard ABA as a primary intervention
Cause-and-effect learning	**Relatively preserved in structured, predictable, non-social contexts**	**Often inconsistent due to neurocognitive impairment**
Response to reinforcement	Often reliable when contingencies are clear and consistent	Variable and context-dependent
Generalization of skills	Possible with structured support and repetition	Variable; skills are often context-bound, affected by EF

ABA in ASD vs FASD

Conceptual synthesis by Senturias, Y., 2026, informed by: Kodituwakku, 2007; Paley & O'Connor, 2009; Bertrand, 2009; Rasmussen & Bisanz, 2009; Kable et al., 2016; APA DSM-5, 2013.

30

Feature	ASD	FASD
Impact of cognitive or emotional load	Skills may hold under moderate load	Performance deteriorates rapidly under load
Recommended intensity	May benefit from structured, time-limited ABA with clear goals	No evidence, may support adaptive skills
Most effective behavioral focus	Skill teaching, communication, adaptive behaviors	Antecedent modification, environmental supports, caregiver coaching
Risk if misapplied	Burnout if overly rigid or intensive	Escalation, shame, repeated "failure," trauma reinforcement
Best-practice framing	Developmental + behavioral intervention	**Neurobehavioral, brain-based intervention**

ABA in ASD vs FASD

Conceptual synthesis by Senturias, Y., 2026, informed by: Kodituwakku, 2007; Paley & O'Connor, 2009; Bertrand, 2009; Rasmussen & Bisanz, 2009; Kable et al., 2016; APA DSM-5, 2013.

31

A 17-year-old girl, who was exposed to alcohol before birth, has been very sensitive to lights and sounds, needed repetitive routines to feel comfortable, and had difficulty involving others in her interests since she was young.

As she has become a teenager, these traits have evolved into a very intense focus on specific interests and a struggle with the natural "give-and-take" of social conversations.

She often struggles to organize her day, solve problems on the fly, or learn the basic life skills that many other teenagers pick up more easily.

32

Evaluation Results

SRS (Social Responsiveness Scale); High score
She has difficulty with social interactions and repetitive behaviors

ADOS- 2 (Autism Diagnostic Observation Schedule); score consistent with autism spectrum.
When she is tested one on one, she has enough autism symptoms to be consistent with a diagnosis.

BRIEF (Behavior Rating Inventory of Executive Function); high score
She has difficulties in working memory, planning, organization, inhibition, and emotional control.

ABAS (Adaptive Behavior Assessment System); low scores
Difficulty with skills of everyday living.

CBCL (Child Behavior Checklist); high scores in Anxious/Depressed, Withdrawn/Depressed, Social Problems, Thought Problems, Attention Problems

33

Questions for Small Groups

What would you diagnose this teenager with?

What are the struggles she is experiencing that affect functioning the most?

What interventions could be helpful?

34

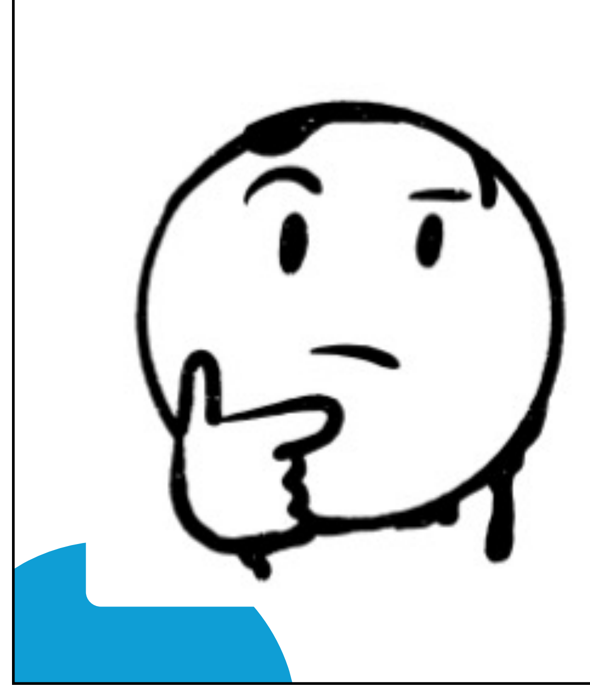
Take Home Points

- She meets criteria for both autism spectrum disorder and FASD.
- Identifying that she has both conditions allows her family and teachers to provide specific support.
- Her interventions can now focus on her specific needs by helping her:
  - Understand the unwritten rules of social interaction (social skills groups),
  - Manage sensory overload before it becomes overwhelming and build practical safety skills for her transition into adulthood (OT, school)
  - Organize her day (executive function skills)
  - Manage emotions (CBT)

35

Objective 3: Strengthening Communication

36



Audience Discussion

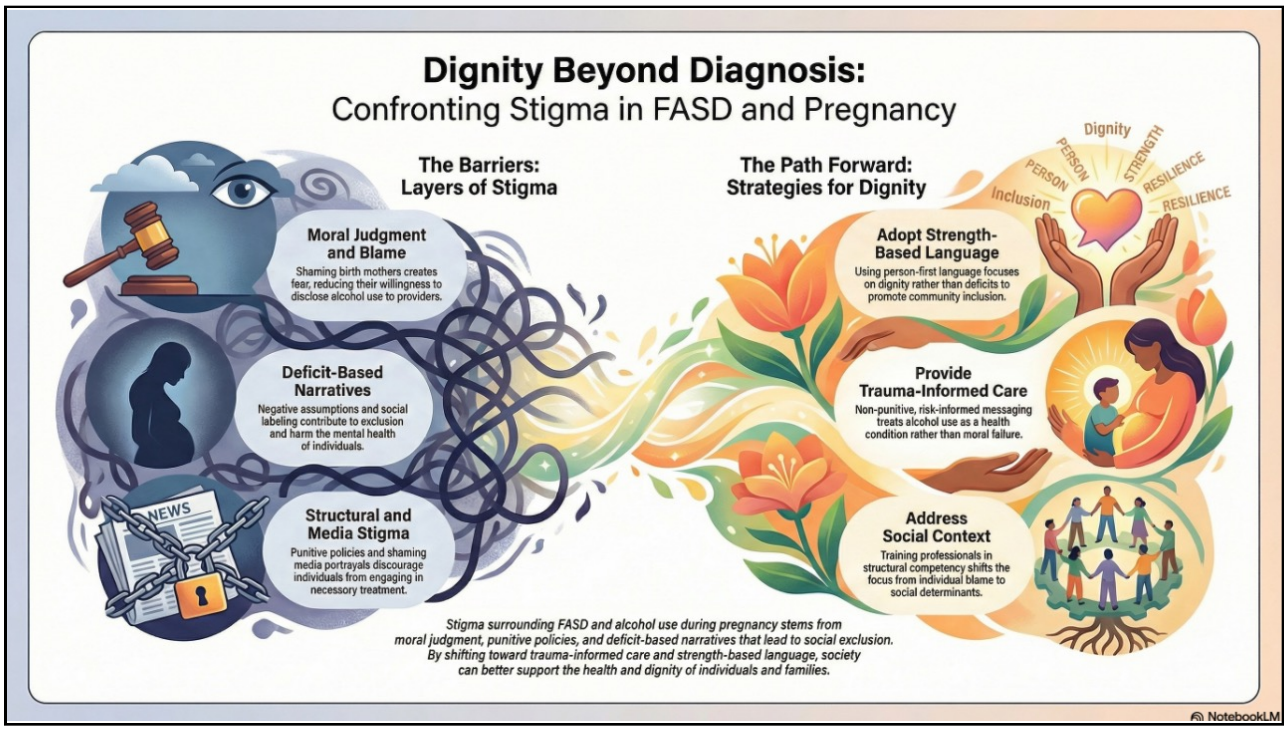
Why do you think autism might get more attention, resources, recognition than FASD?

37

Understanding Stigma in FASD and Autism

Presentation title April 16, 2026 38

38



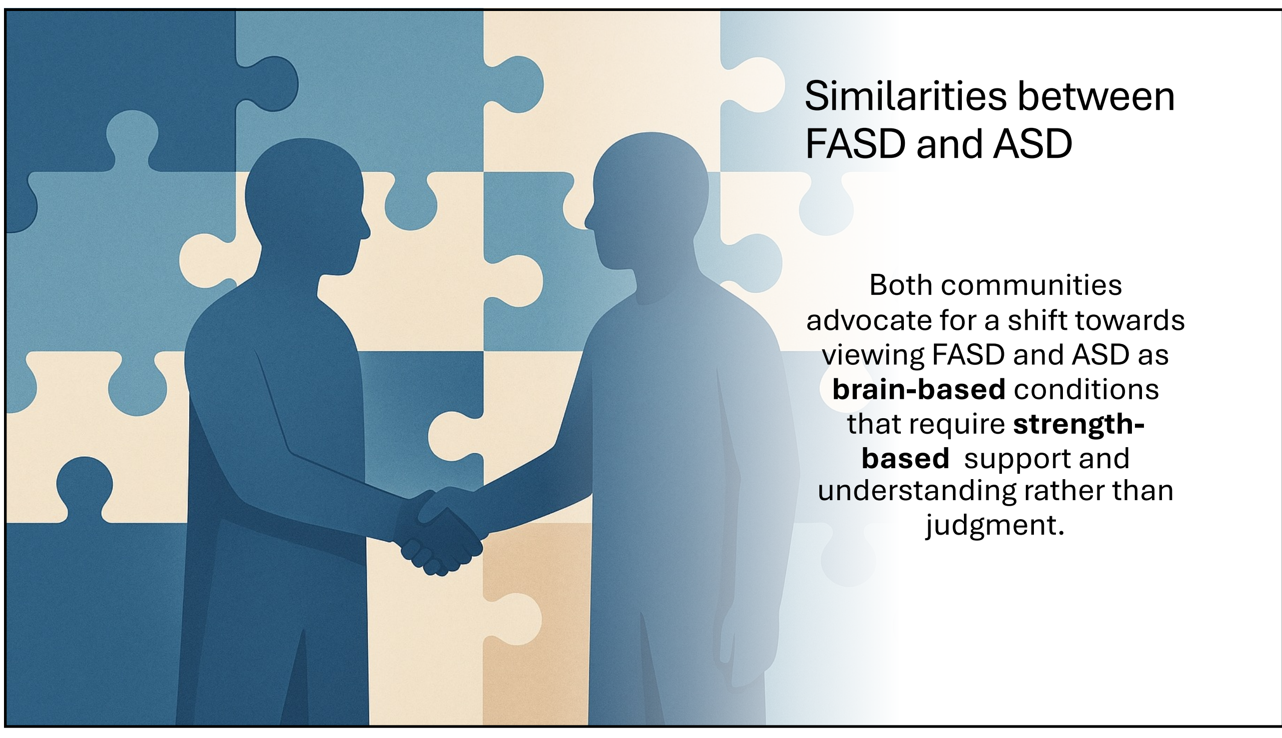
39

Key Differences in Stigma Between FASD and ASD

CATEGORY	FASD	ASD
Primary Source of Stigma	Judgment of birth parents	Misunderstanding of behaviors
Perceived Origin	Seen as preventable; blame toward mothers	Not seen as preventable; multifactorial
Diagnosis Challenges	Limited training; barriers	More training; more services
Support Availability	Fewer interventions	More interventions
Interpretation of Behaviors	Seen as willful disobedience	Seen as brain-based
Effects	Shame, guilt, isolation	Masking; mental health
Identity Framing	Less tied to neurodiversity	Neurodiversity embraced

4/16/26 Sample Footer Text 40

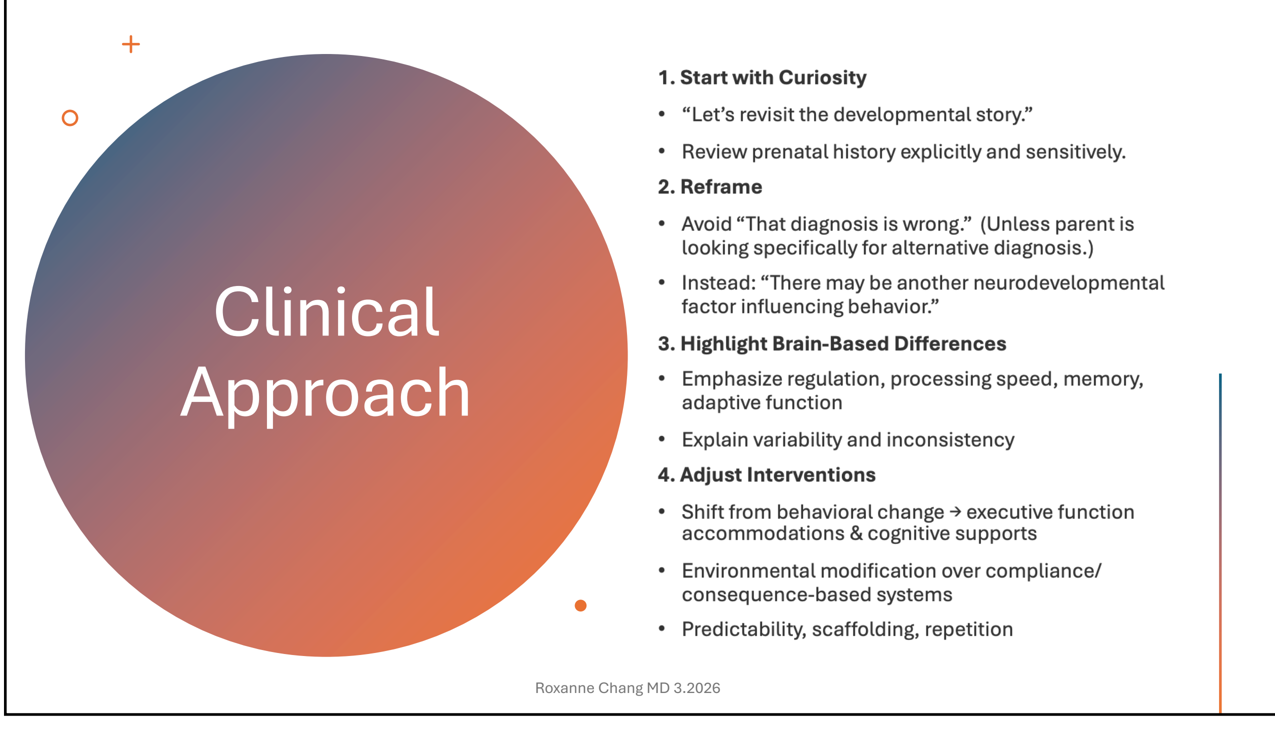
40



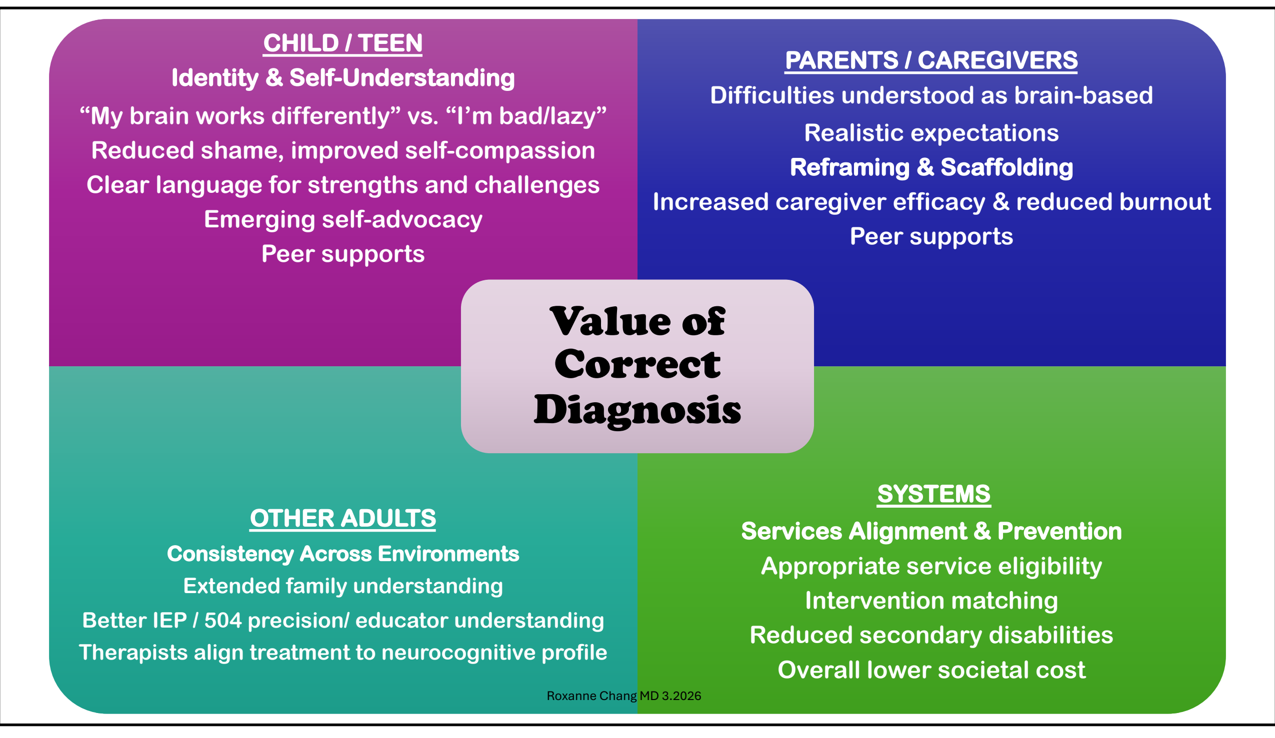
41

Diagnosed with ASD, but profile really fits FASD – what next?

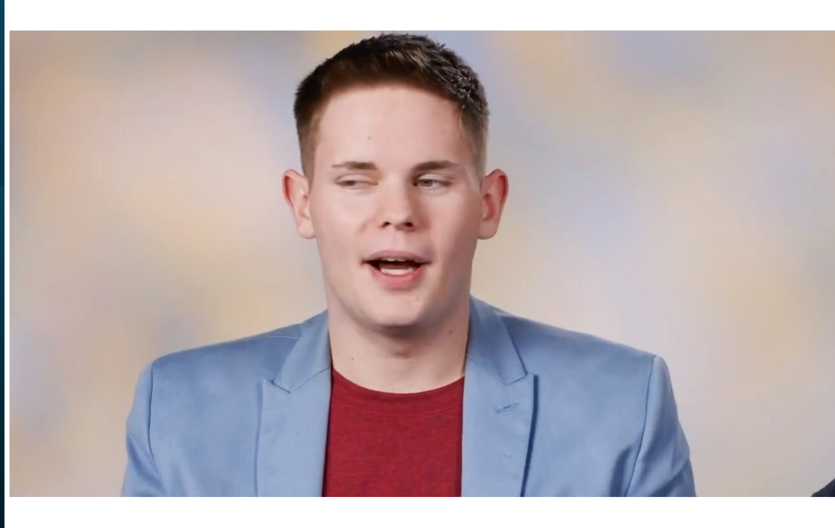
42



43



44



45

Select References

- American Academy of Pediatrics: Common diagnostic approaches in fetal alcohol spectrum disorder https://www.aap.org/en/patient-care/fetal-alcohol-spectrum-disorders/diagnosis/common-diagnostic-approaches-in-fetal-alcohol-spectrum-disorder/
- American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 5th ed. 2013
- Bishop SL, Gahagan S, Lord C. Re-examining the core features of autism: a comparison of autism spectrum disorder and fetal alcohol spectrum disorder. *J Child Psychol Psychiatry.* 2007;48(11):1111-1121. doi:10.1111/j.1469-7610.2007.01782.x
- Carpita B, Migli L, Chiarantini I, et al. Autism spectrum disorder and fetal alcohol spectrum disorder: a literature review. *Brain Sci.* 2022;12(6). doi:10.3390/brainsci12060792
- Fernandes-Magalhaes R, Labrado L, Ferrera D, et al. Differentiating fetal alcohol spectrum disorder from other neurodevelopmental disorders: neurocognitive and socio-emotional evidence. *Front Neurosci.* 2025;19. doi:10.3389/fnins.2025.1716494
- Flannigan K, Coons-Harding KD, Anderson T, et al. A systematic review of interventions to improve mental health and substance use outcomes for individuals with prenatal alcohol exposure and fetal alcohol spectrum disorder. *Alcohol Clin Exp Res.* 2020.
- Hagan JF, Balachova T, Bertrand J, et al. Neurobehavioral disorder associated with prenatal alcohol exposure. *Pediatrics.* 2016;138(4):e20151553. doi:10.1542/peds.2015-1553
- Hoyme HE, Kalberg WO, Elliott AJ, et al. Updated clinical guidelines for diagnosing fetal alcohol spectrum disorders. *Pediatrics.* 2016;138(2):e20154256.
- Kautz-Turnbull C, Adams TR, Petrenko CLM. The strengths and positive influences of children with fetal alcohol spectrum disorders. *Am J Intellect Dev Disabil.* 2022;127(5):355-368. doi:10.1352/1944-7558-127.5.355

46

Select References (continued)

- Lange S, Rehm J, Anagnostou E, Popova S. Prevalence of externalizing disorders and autism spectrum disorders among children with fetal alcohol spectrum disorder: systematic review and meta-analysis. *Biochem Cell Biol.* 2018;96(2):241-251. doi:10.1139/bcb-2017-0014
- McLachlan K, Flannigan K, Temple V, Unsworth K, Cook JL. Difficulties in daily living experienced by adolescents, transition-aged youth, and adults with fetal alcohol spectrum disorder. *Alcohol Clin Exp Res.* 2020.
- Olson HC, Pruner M, Byington N, Jirikowic T. FASD-informed care and the future of intervention. In: Abdul-Rahman and Petrenko (ed) *FASDs A Multidisciplinary Approach*. 2023:269-362.
- Reid N, Dawe S, Shelton D, et al. Systematic review of fetal alcohol spectrum disorder interventions across the life span. *Alcohol Clin Exp Res.* 2015.
- Stagnone N, Thorne J, Mattson J, Kover ST. Executive and social functioning in fetal alcohol spectrum disorders: comparison to autism. *Am J Intellect Dev Disabil.*
- Stevens SA, Nash K, Koren G, Rovet J. Autism characteristics in children with fetal alcohol spectrum disorders. *Child Neuropsychol.* 2013;19(6):579-587. doi:10.1080/09297049.2012.727791
- Wozniak JR, Riley EP, Charness ME. Clinical presentation, diagnosis, and management of fetal alcohol spectrum disorder. *Lancet Neurol.* 2019.
- Young E, Stade B, Falsetti A, Fulford E, Jegathesan T. Prevalence of autism in children prenatally exposed to alcohol: a pilot study. *Paediatr Child Health.* 2016;21(suppl 5):e67. doi:10.1093/pch/21.suppl_5.e67

47

48