

Psychiatric and Neurodevelopmental Comorbidities in XXY

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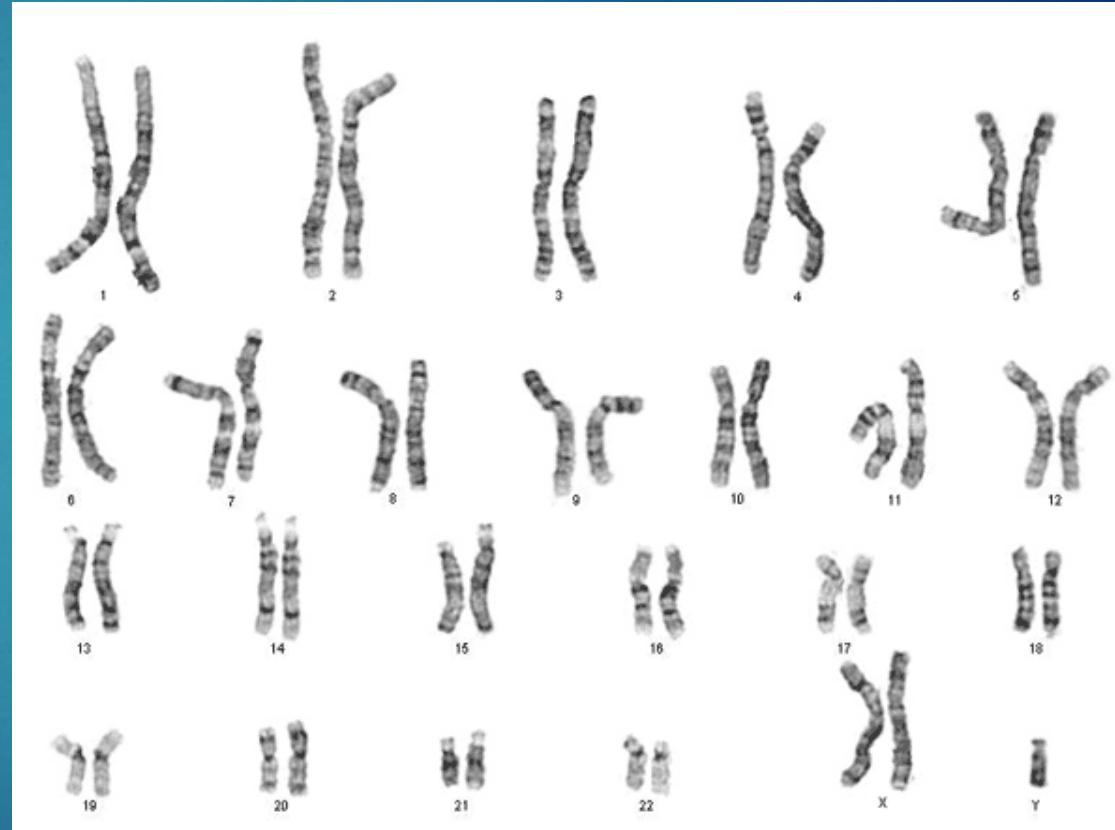
CHILDREN'S NATIONAL HEALTH SYSTEM
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Objectives

- ▶ Briefly review what previous research has demonstrated regarding rates of neurodevelopmental and psychiatric diagnoses in XXY
- ▶ Provide preliminary results from our sample of individuals with XXY in order to:
 - ▶ Discuss the variability in symptomatology among individuals with XXY
 - ▶ Underscore the need for multidisciplinary and comprehensive evaluation, and treatment
- ▶ Briefly provide guidance regarding key professionals and types of services that may support areas of struggle

Sex Chromosome Aneuploidy

- ▶ Typically there are 22 pairs of chromosomes plus one pair of sex chromosomes (X,Y)
- ▶ 47, XXY-males have an extra X chromosome

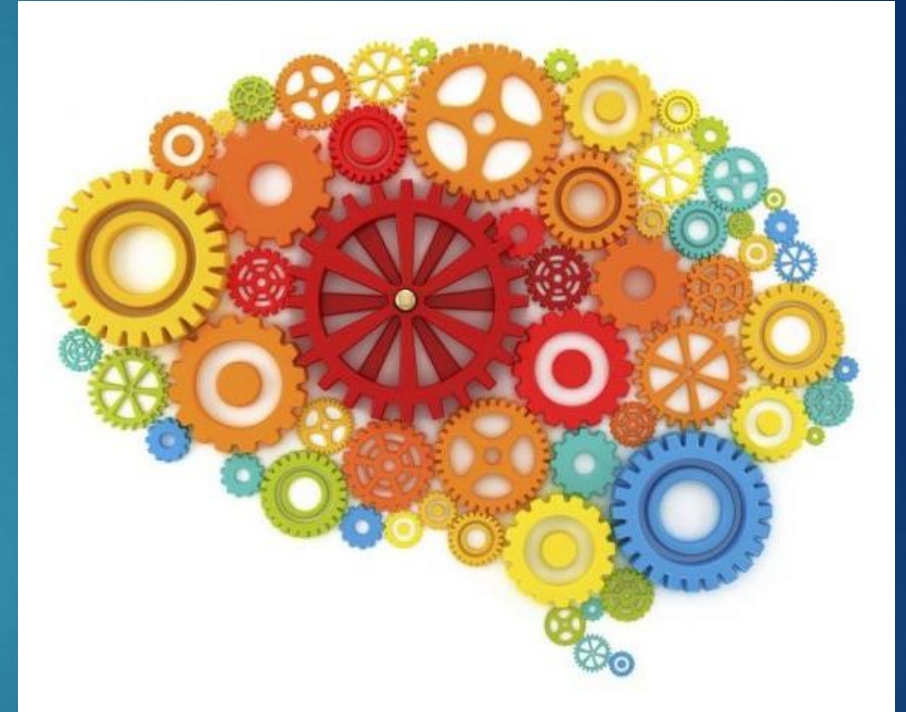


XXY

- Also known as Klinefelter's Syndrome
- Occurs between 1 of 500 and 1 of 1000 live male births
- Many men with XXY go undiagnosed
 - This is changing with an increase in prenatal testing
- Physical features can include:
 - Tall stature, broad hips
 - Smaller testes
 - Difficulty with fertility
 - Most common genetic cause of male infertility

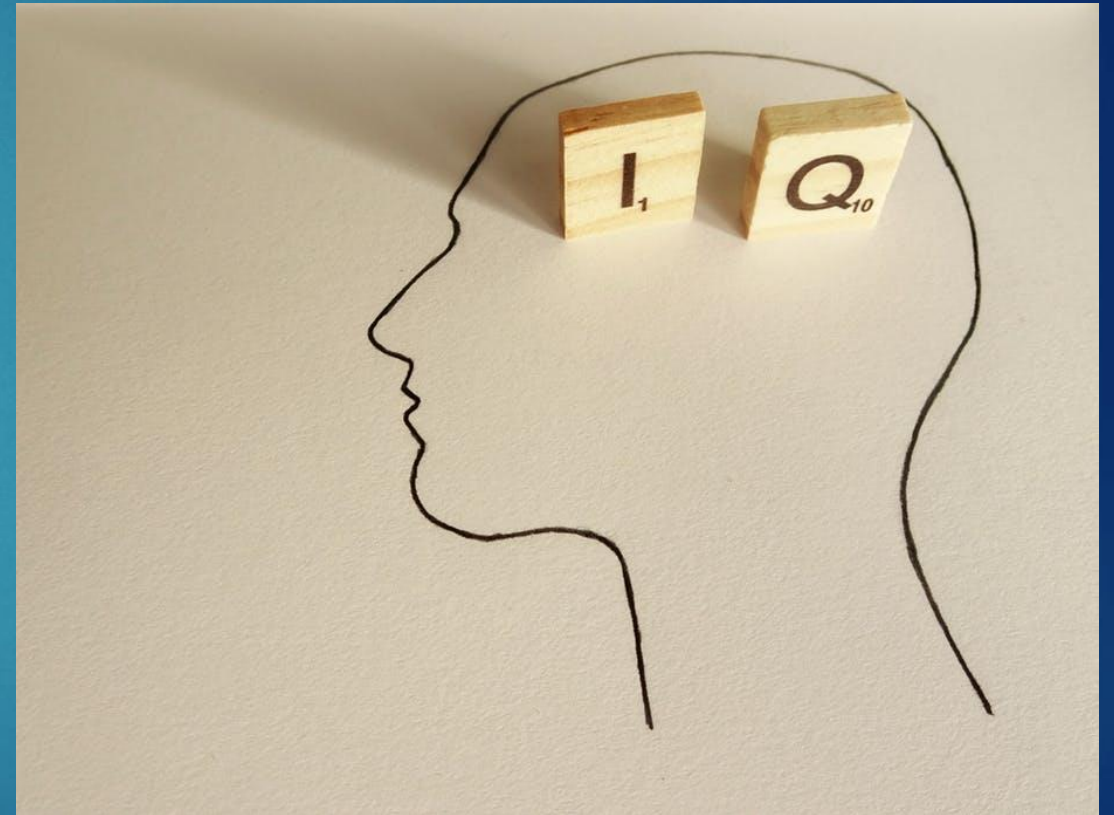
XXY

- #1 rule – great variability in XXY!
- There is an increased risk of impairments with
 - Language
 - Executive functioning
 - Social cognition
 - Emotion regulation
- Struggles in these areas contribute to higher rates of a number of neurodevelopmental and psychiatric diagnoses

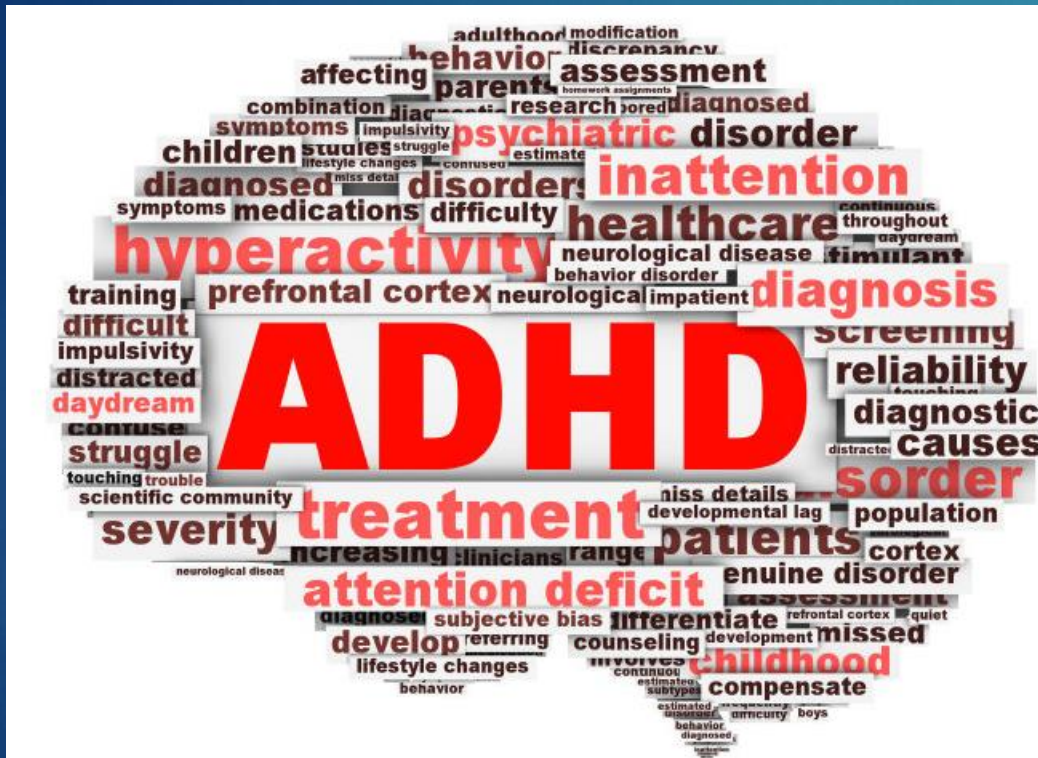


Intellectual functioning (IQ)

- ▶ IQ falls in the average to low average range
- ▶ Typically not in the range of Intellectual Disability
- ▶ At younger ages, some studies indicate relatively stronger visual thinking skills relative to verbal reasoning abilities

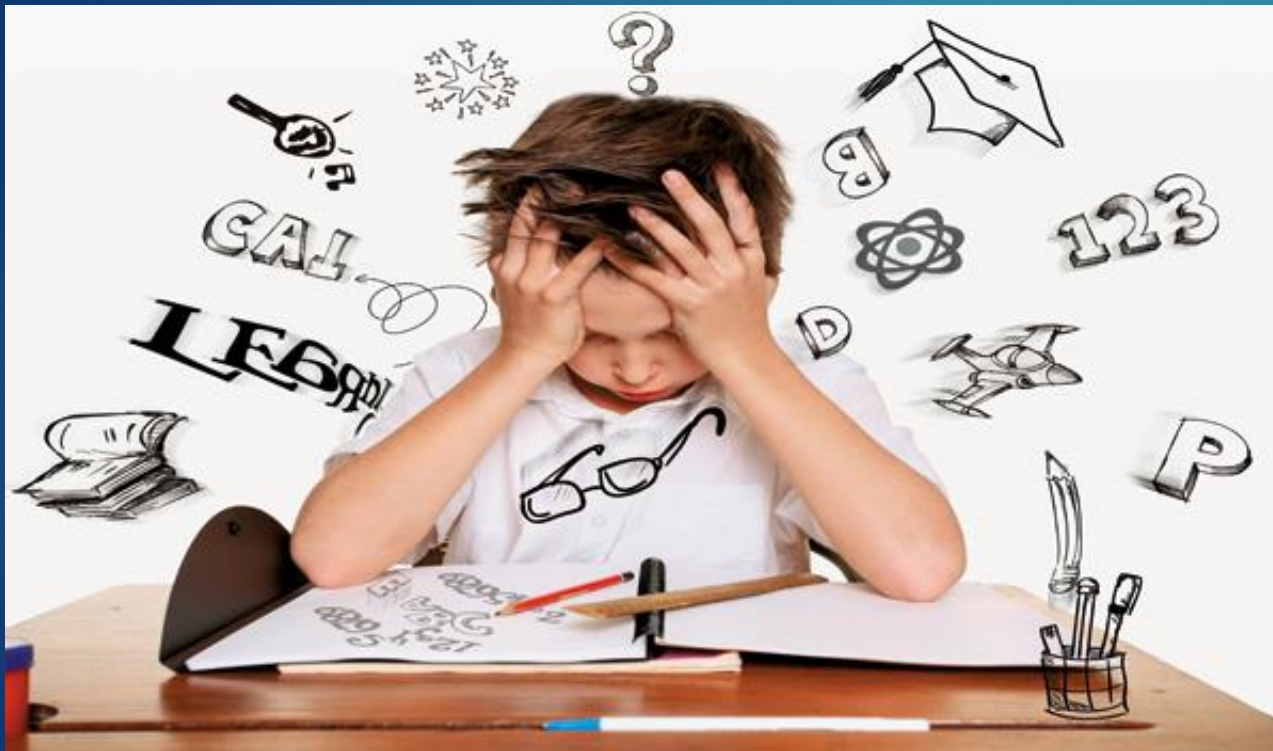


100



- ▶ **ADHD rates amongst 5-20 yr olds with XXY**
 - ▶ **36% (20 out of 56)**
 - ▶ **95% (19 of the 20) with ADHD – Inattentive subtype**
 - ▶ **5% (1 of the 20) with ADHD – Combined subtype**
- ▶ **ADHD was diagnosed 5.6 times more often in adult men with XXY compared to men with XY**
- ▶ **Impacts grades and academic achievement**

Learning Disorder (LD)



- ▶ Reading disability in XXY: 50-75%
- ▶ Literacy and spelling especially impacted, but struggles are not limited to these areas
- ▶ Pace of acquiring academic skills can be slower relative to unaffected classmates
- ▶ Struggles can persist into adulthood

Autism Spectrum Disorder (ASD)

- ▶ ASD rates vary depending on the method of diagnosis
 - ▶ Screening measures alone and/or parent interview: 12-47%
 - ▶ Comprehensive assessment: 5-10%
- ▶ ASD diagnosed 6.2 times more often in men with XXY compared to XY



Mood/ Depression



- ▶ Different Mood disorder subtypes
 - ▶ Major Depressive Disorder
 - ▶ Dysthymia
 - ▶ Disruptive Mood Dysregulation Disorder
- ▶ 300 million ppl suffer from depression
 - ▶ Lifetime prevalence – 11% amongst 13-18 yr olds
- ▶ Rates of depressive disorder in XXY 12-24%

Anxiety

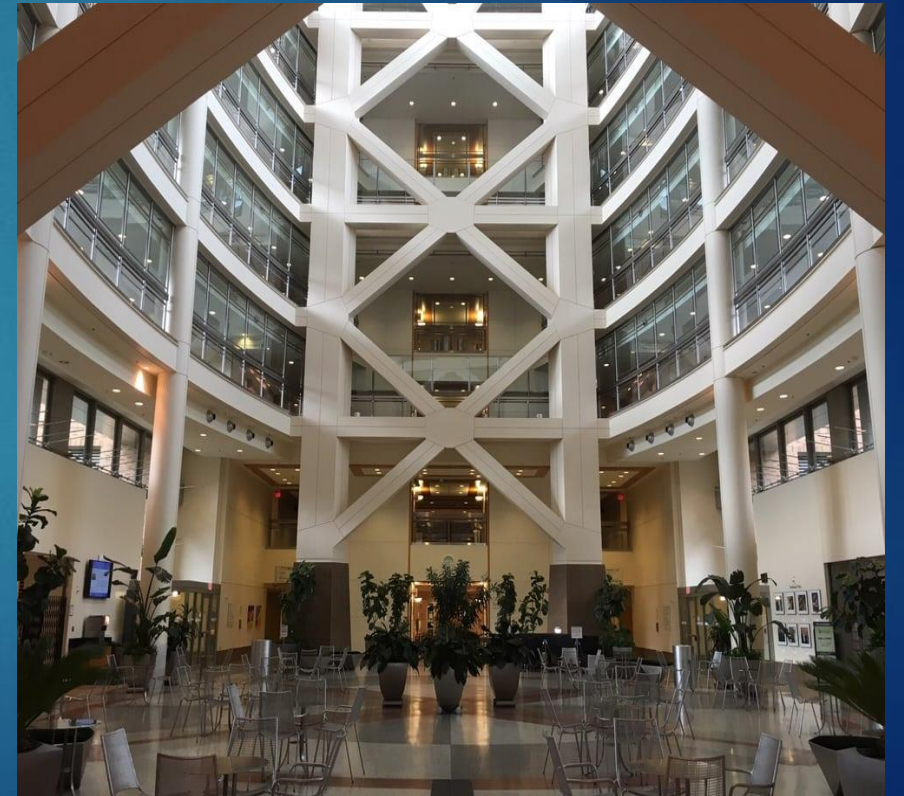
- ▶ Common subtypes of anxiety disorder
 - ▶ Generalized Anxiety Disorder
 - ▶ Social Anxiety Disorder
 - ▶ Phobia
- ▶ Rates of anxiety disorder in XXY range from 14-32%



Additional comorbid diagnoses seen in XXY

- ▶ Psychosis
- ▶ Bipolar Disorder
- ▶ Obsessive Compulsive Disorder (OCD)
- ▶ Tourette's / Tic Disorder

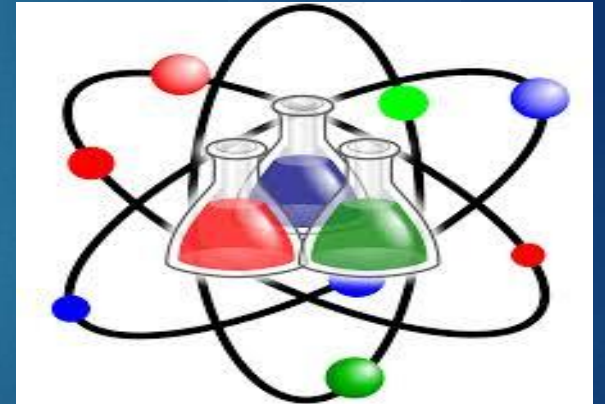
X And Y Chromosome Variation Development Study At NIH



We all have our own strengths and weaknesses

Can you solve this Fruit Math equation?

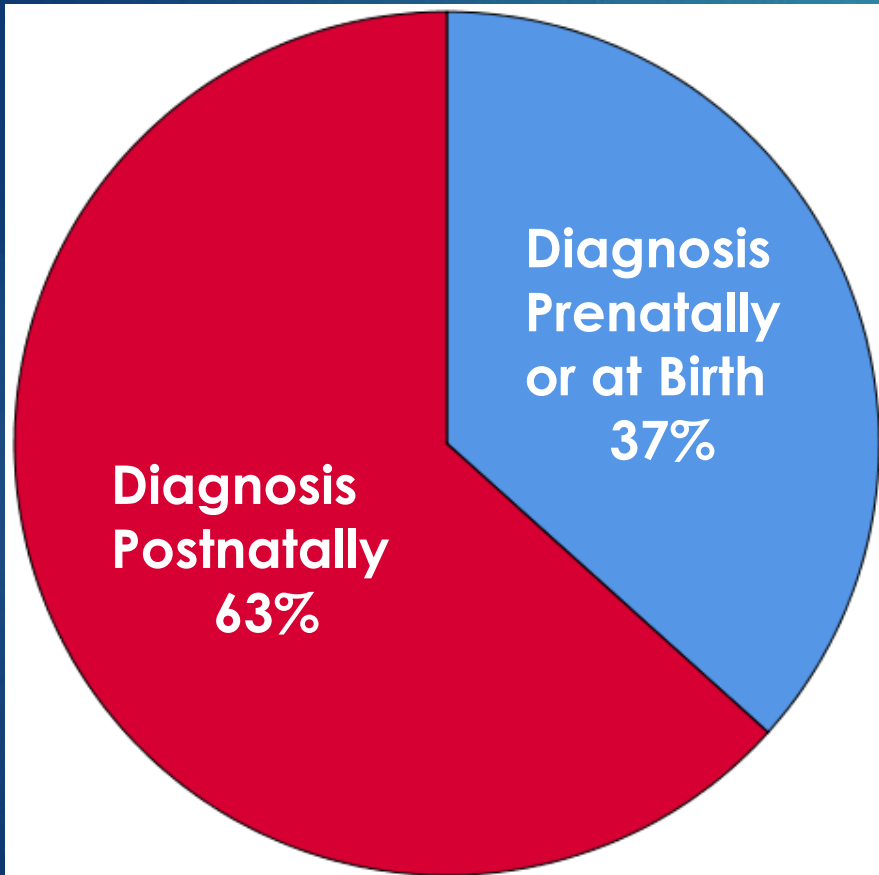
$$\begin{aligned} \text{Apple} &= 7 \\ \text{Grapes} &= 5 + \text{Apple} \\ \text{Apple} &= 1 + \text{Banana} \\ \text{Apple} + \text{Grapes} + \text{Banana} &= ? \end{aligned}$$



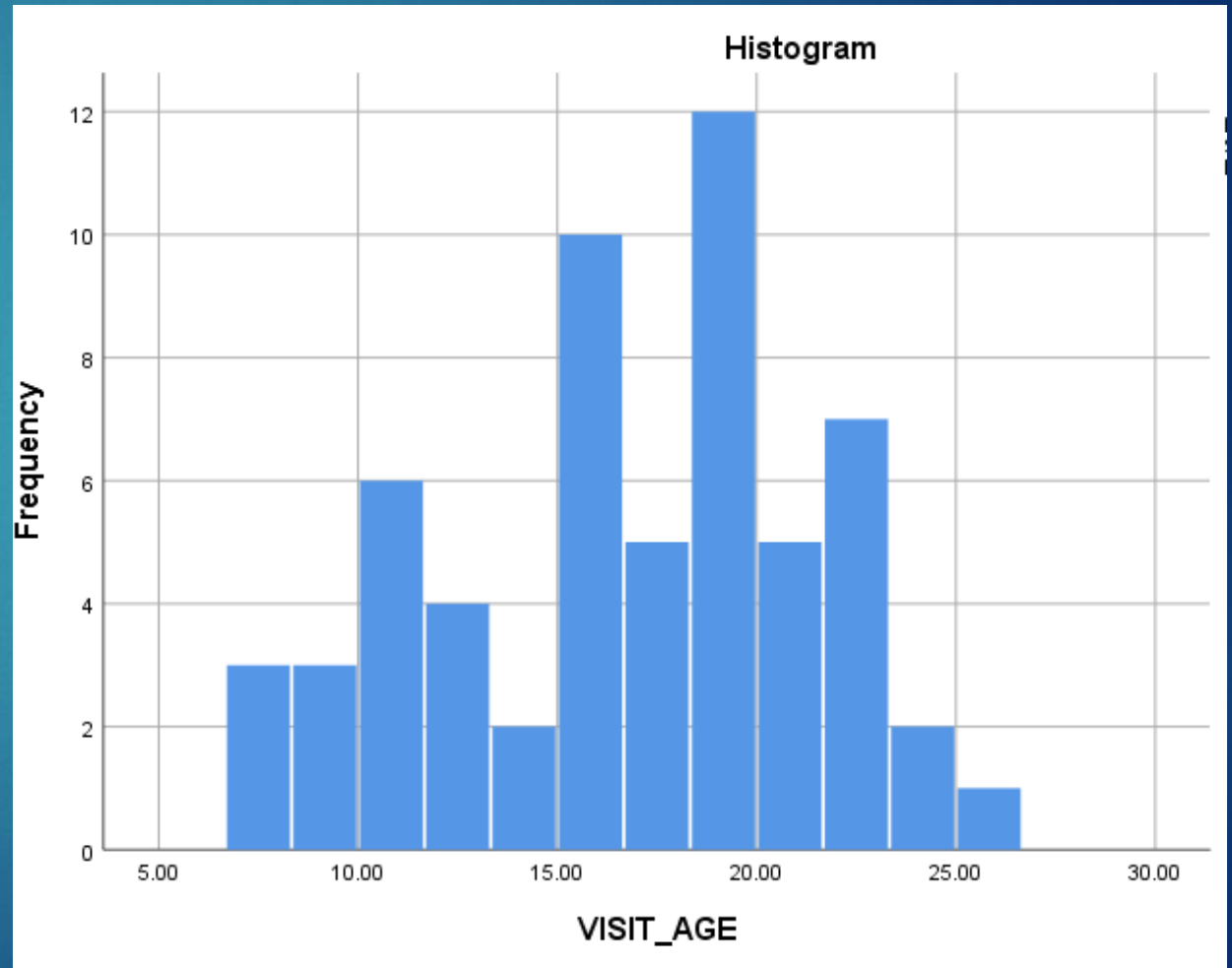
Demographic characteristics of Participants seen to date

Characteristic	Statistic
Total participants seen	60
Age (years)	Mean=16.8; Median= 17.5; Range= 7-25
Number diagnosed prenatally or at birth [n (%)]	22 (37%)
Number diagnosed postnatally [n (%)]	38 (63%)
Age at postnatal diagnosis (years)	Mean=10.6; Range= 0.5-20

Prenatal versus Postnatal Diagnosis

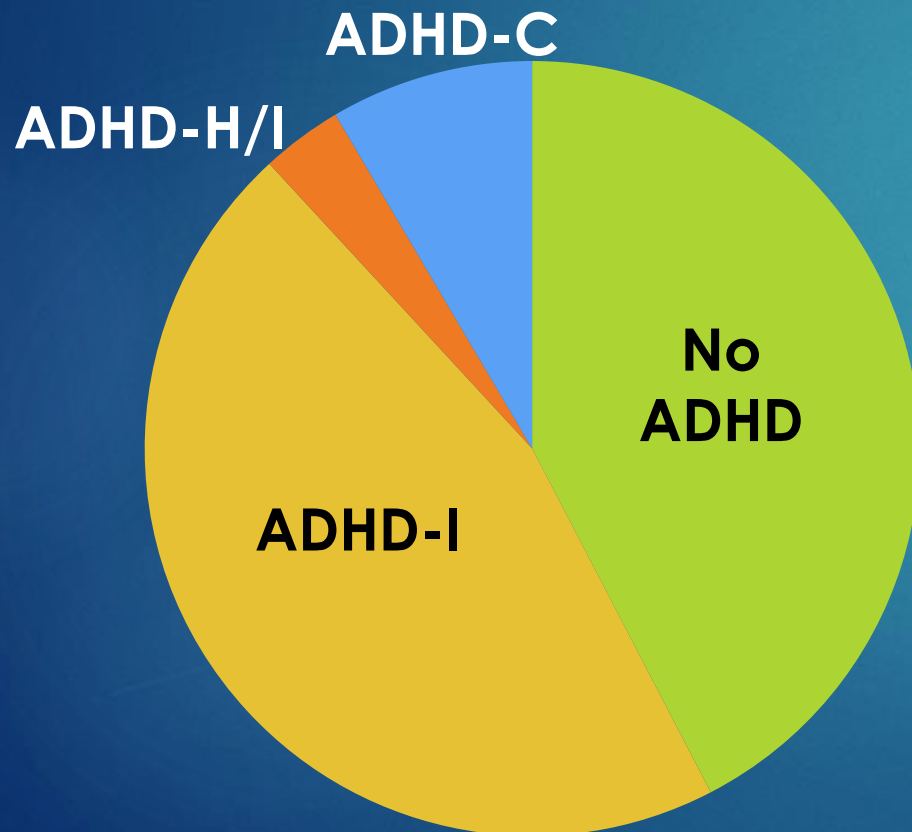


Age Distribution



ADHD

- 57% (N=34) with ADHD
 - Majority with ADHD Inattentive Presentation



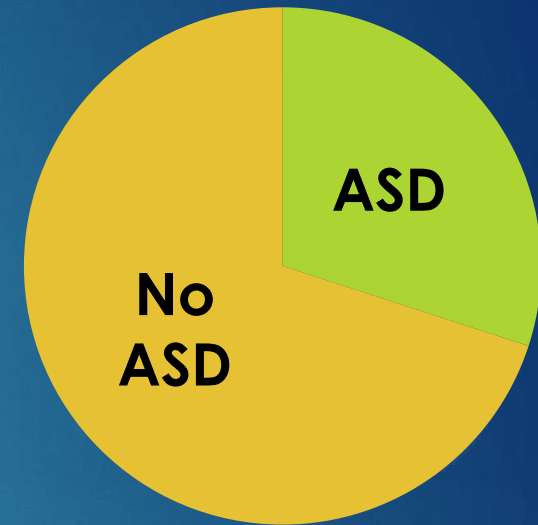
No Diagnosis, no problems? Not quite...

- Clinically elevated challenges in those without ADHD (N=25) :
 - Attention (12%)
 - Executive functioning (20%)

Autism Spectrum Disorder (ASD)

- Comprehensive assessment
- 12 (20%) had a prior ASD diagnosis
 - 2 with prior diagnoses did not meet criteria for ASD
 - 10 ASD diagnoses maintained
- 48 (80%) came in without prior ASD
 - 8 were diagnosed with ASD for the first time
- Total rate in our sample is 30%**

**Interim rate; data collection ongoing



- Clinically elevated challenges in those without ASD
 - 35% with Social Skills
 - 50% with Executive functioning

K-SADS

- ▶ Schedule for Affective Disorders and Schizophrenia for School Aged Children
- ▶ Assessment completed with parent/guardian
- ▶ Current Diagnoses
- ▶ Past Diagnoses

The image shows the front cover of the K-SADS-PL DSM-5 assessment form. The title 'K-SADS-PL DSM-5' is prominently displayed in large, bold, black letters, with 'November 2016' written below it in a smaller, bold, black font. Below the title, there is a box containing the 'Includes:' section, which lists the components of the assessment: A. Screen Interview, B. Supplements (I. Depressive and Bipolar Related Disorders Supplement, II. Schizophrenia Spectrum and Other Psychotic Disorders Supplement, III. Anxiety, Obsessive-Compulsive, and Trauma-Related Disorders Supplement, IV. Neurodevelopmental, Disruptive, and Conduct Disorders Supplement, V. Eating Disorders and Substance-Related Disorders Supplement). At the bottom of the page, there is a section for the 'Advanced Center for Intervention and Services Research (ACISR) for Early Onset Mood and Anxiety Disorders Western Psychiatric Institute and Clinic' and the 'Child and Adolescent Research and Education (CARE) Program, Yale University'. The bottom of the page features a series of boxes for 'Subject', 'Date' (month, day, year), and 'Interviewer', along with a 'Draft' checkbox and a small logo.

K-SADS-PL DSM-5
November 2016

Includes:
A. Screen Interview
B. Supplements
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III. Anxiety, Obsessive-Compulsive, and Trauma-Related Disorders Supplement
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Advanced Center for Intervention and Services Research (ACISR)
for Early Onset Mood and Anxiety Disorders
Western Psychiatric Institute and Clinic

Child and Adolescent Research and Education (CARE)
Program, Yale University

Subject

Date / / 20

Interviewer

☐ Draft

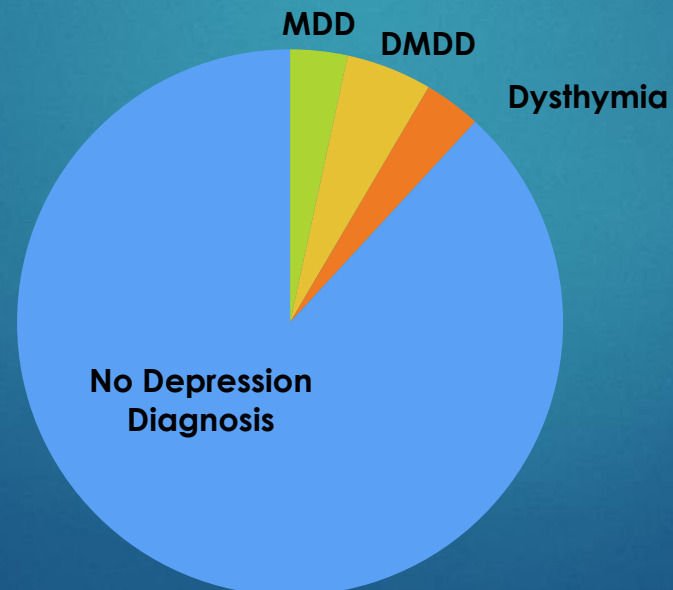
Mood

Met criteria for MDD

- ▶ 11.7% met criteria for any mood disorder
 - ▶ MDD 3.3%
 - ▶ Dysthymia 3.3%
 - ▶ DMDD 5%

Difficulties amongst those without a depressive disorder

- ▶ 28.8% CBCL internalizing



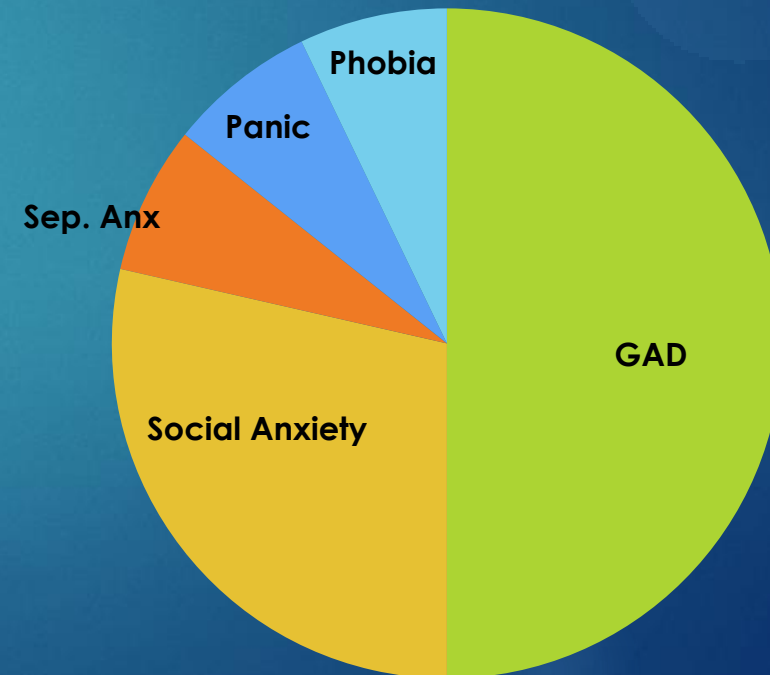
Anxiety

KSADS

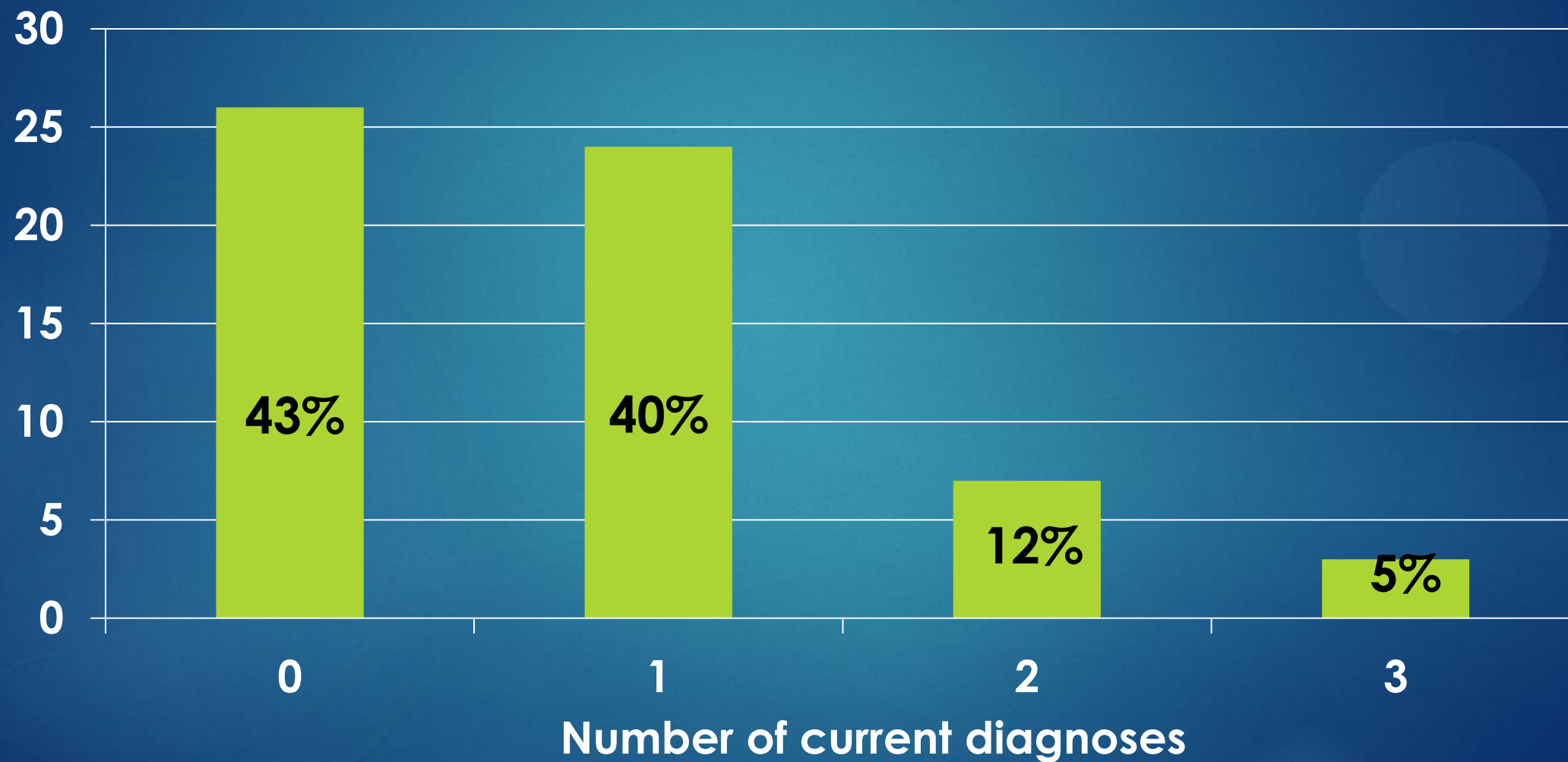
- ▶ 20% met criteria for an anxiety disorder per the KSADS
- ▶ 11.7% met criteria for GAD
- ▶ 6.7% met criteria for Social Anxiety

Difficulties amongst those without an anxiety diagnosis

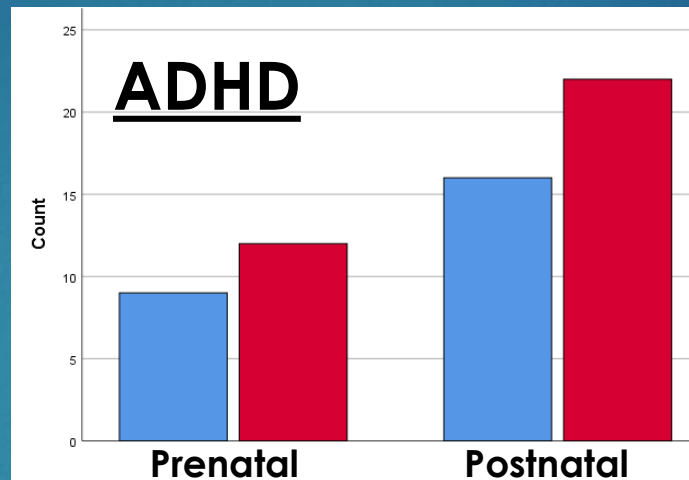
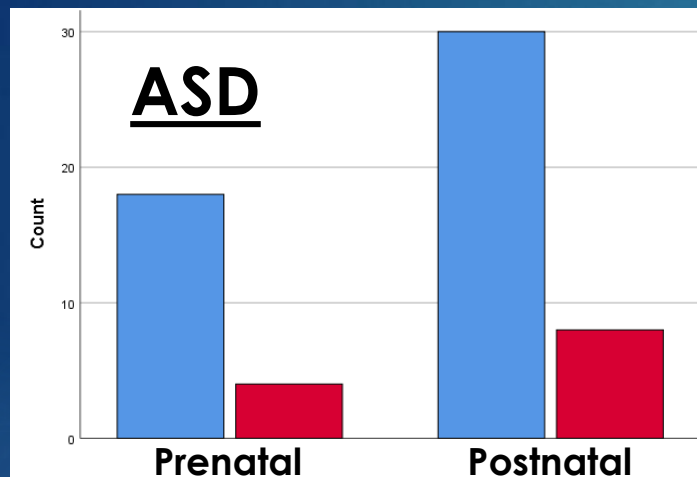
- ▶ 17% CBCL internalizing





Number of diagnoses

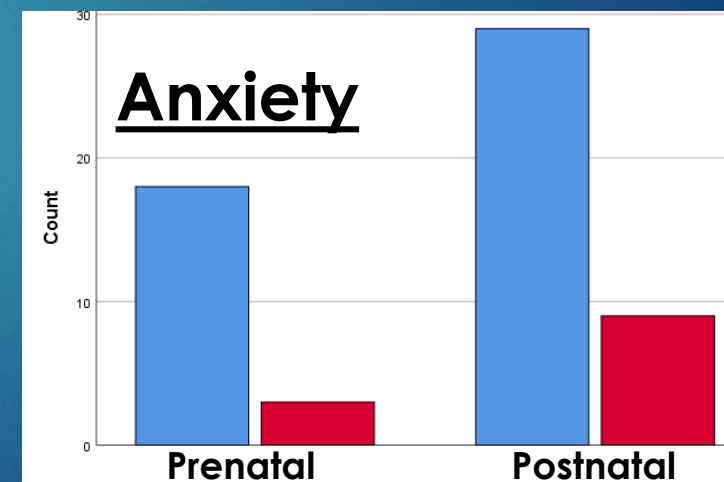
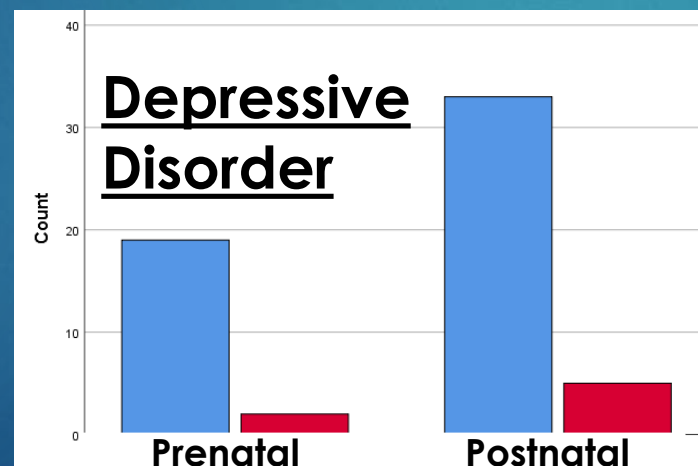


Prenatal vs. Postnatal



 Diagnosis not present

 Diagnosis present



Take home points

- ▶ Individuals with KS are at greater risk for a number of neurodevelopmental and psychiatric diagnoses
- ▶ If you have concerns about a child's development, seek (or refer for) evaluation and treatment
- ▶ Symptoms should not be attributed to their genetic diagnosis alone
- ▶ Symptoms can improve with appropriate interventions
- ▶ Often a diagnosis can aid in getting to the right intervention



**See something.
Say something.**

Types of supports

- ▶ Speech-language
- ▶ ABA
- ▶ Social Skills group
- ▶ IEP/504 plan
- ▶ Academic interventions
- ▶ Psychotherapy
- ▶ Psychiatry
- ▶ Endocrinology
- ▶ Transition supports
 - ▶ AXYS resources
 - ▶ Statewide agencies



Our Team

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Thank you!

Questions?

If interested in learning more about or joining our study,
please contact Jonathan Blumenthal , MA at

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Flyers with study details are also available at our table.

References

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