

ADHD and Substance Abuse: *A Longitudinal Perspective*



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Longitudinal Study

- **Between 1970 and 1978, we diagnosed 207 boys, ages 6 to 12 (Mean 8 years), with what is now called ADHD.**
- **They have been followed up 3 times:**
 - **At age 18**
 - **At Age 25**
 - **At age 41 – 33 years after the original diagnosis**

Origin

From 1970 to 1978:

Over 1,000 children, ages 6-12 years, were assessed at a no-cost child psychiatric research clinic.

Of these:

226 Caucasian children (207 boys, 19 girls) met the following criteria:

Study Entry Criteria in Childhood

1. Ages 6 through 12
2. School referral for behavior problems
3. Rated hyperactive at home AND school
4. Previous history of behavior problems
5. Normal IQ (≥ 85 on WISC)
6. No serious aggressive or other antisocial behaviors –
no conduct disorder

Children were EXCLUDED if:

- **School referral involved aggressive or other significant antisocial behaviors;**

OR:

- **The psychiatric assessment revealed a pattern of antisocial activities.**

Confirmation of Absence of Childhood Conduct Disorder

- **Parent & Teacher ratings of childhood CD behaviors were examined:**
 - **Bullying**
 - **Fire-Setting**
 - **Destruction of Property**
 - **Lying**
 - **Theft**
 - **Truancy**

*Would children have met
DSM-IV
ADHD criteria?*

YES

- 1. All subjects were *clinically impaired***
- 2. Very high *parent & teacher ratings* on Inattention (A), Impulsivity (I), and Hyperactivity (H)**
- 3. *Cross-situationality* was required.**
- 4. *Classroom ratings* made by blind observers showed highly significant differences between “index” & “average” children on A, I, and H**

Comparison of CD and ADHD Symptom Ratings

Ratings:

0 = Not at all

1 = Just a little

2 = Pretty much

3 = Very much

Means:

CD Behaviors 0.70

Inattention 2.55

Impulsivity 2.34

Hyperactivity 2.31

Follow-Up Study Design

- **Prospective**
- **Four Time Points-**
 - **Childhood (age 8), Adolescence (age 18), Adulthood (age 25, and age 41)**
- **Normal Comparison Group (matched for residence, sex, age, ethnicity, SES)**
- **Blind Diagnostic Assessments**
- **Clinical Diagnostic Interviews**
- **Interviewers were Trained Clinicians**

At Mean Ages 18 and 25

(ranges 16 – 23)

&

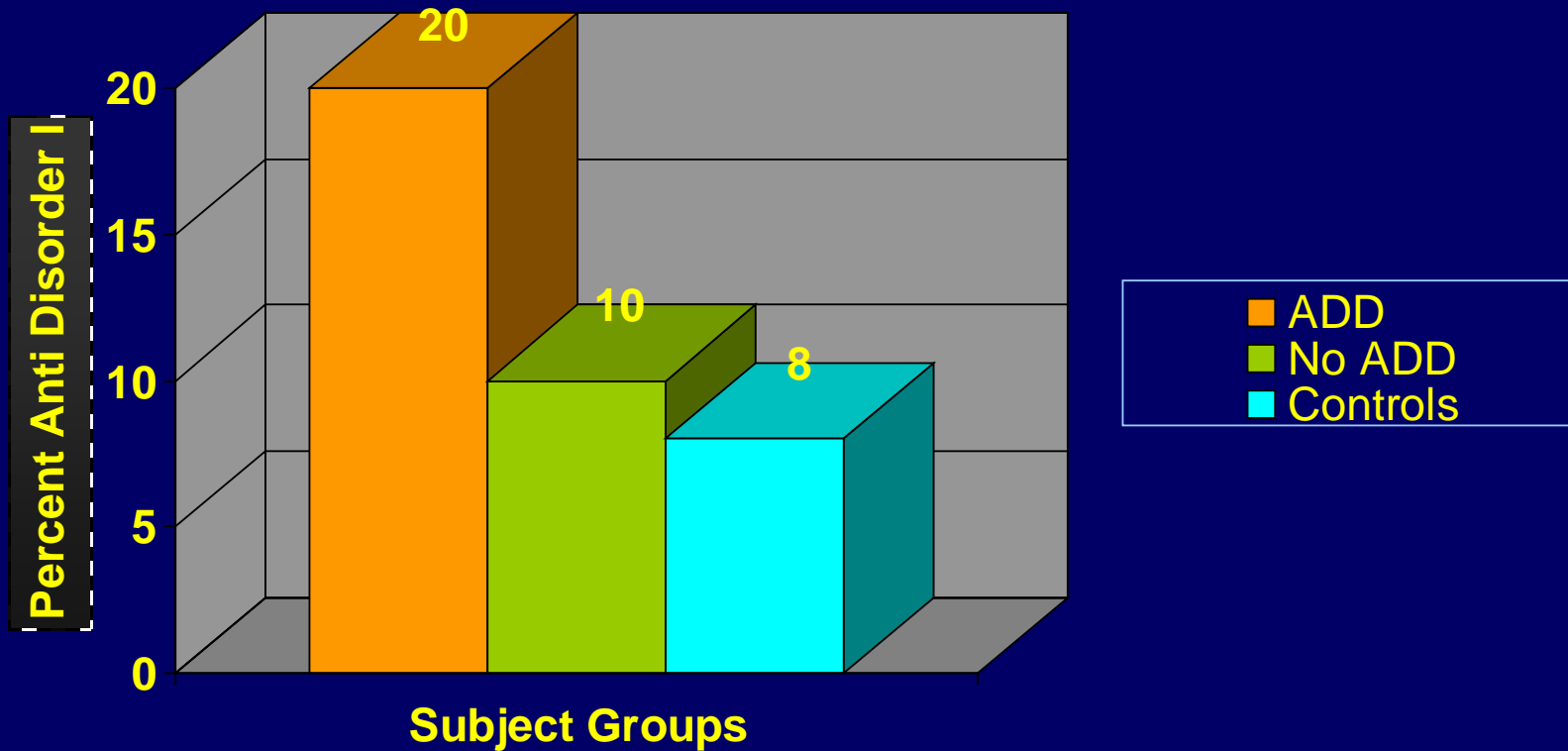
(27 – 33 years)

Three disorders were significantly more prevalent in the ADHD group:

- ▶ ADHD
- ▶ Antisocial Personality Disorder
- ▶ Substance Use Disorders

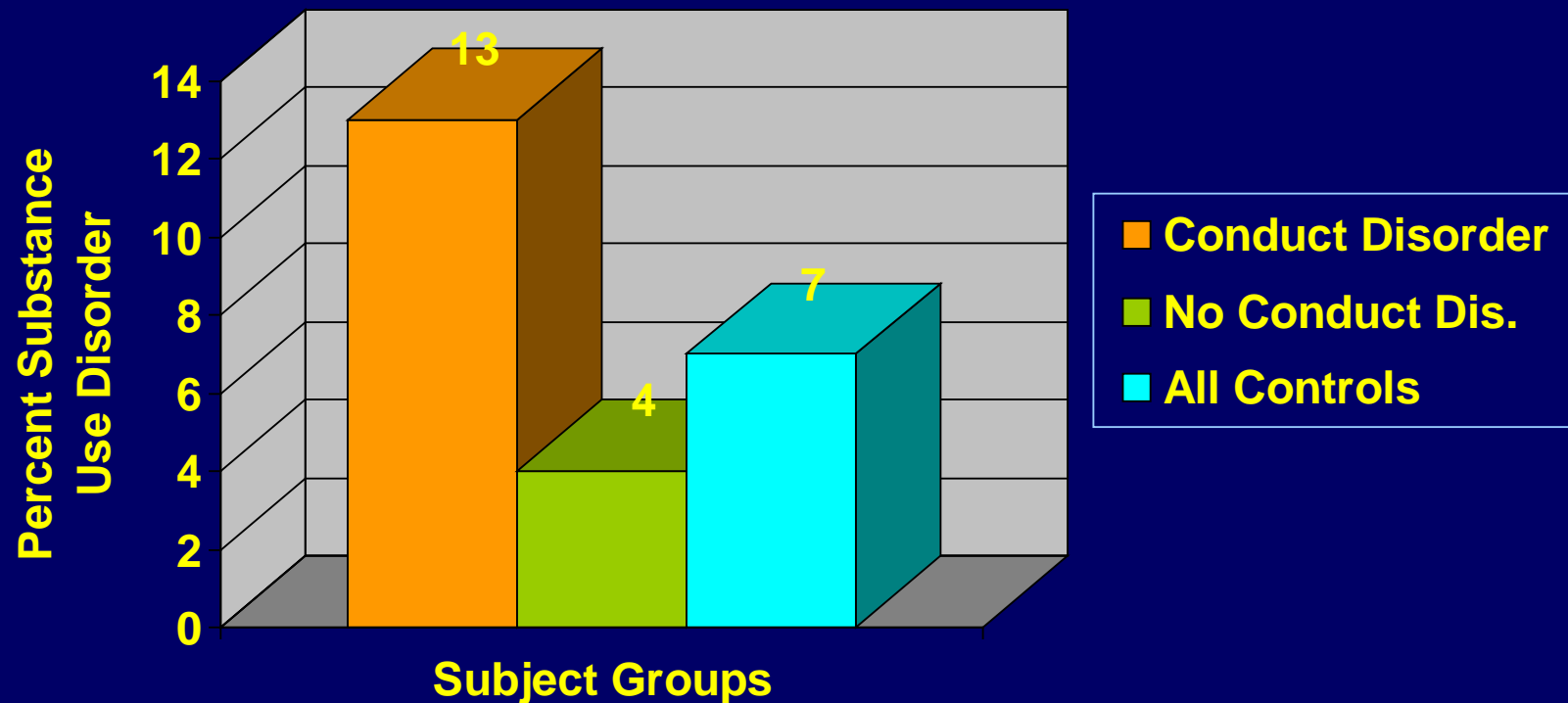
Are these related? YES

% Antisocial Disorder among Subjects with and without Persistent ADD



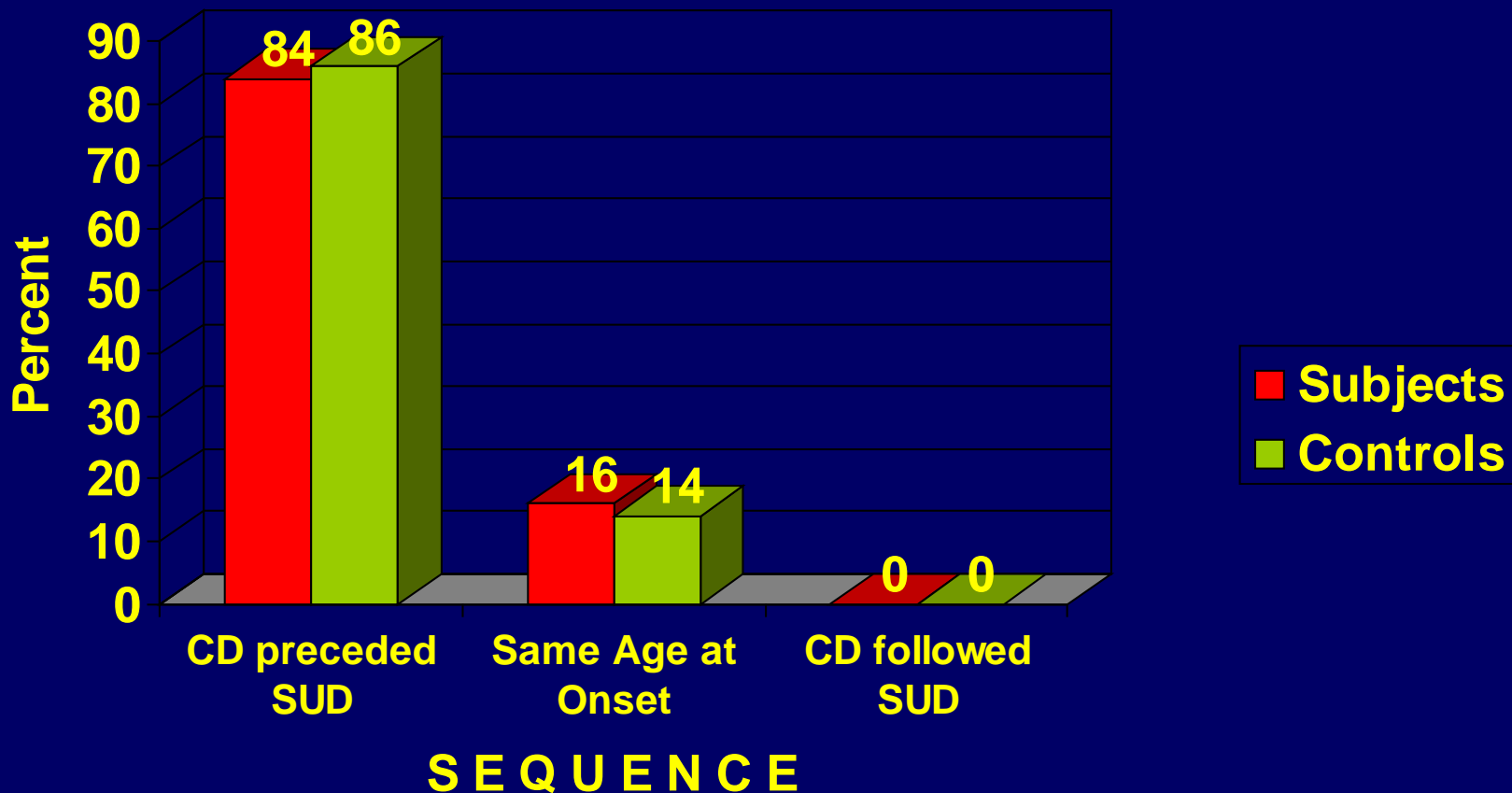
$P < .01$: ADD > No ADD, Controls

Substance Disorders among Subjects with & without Antisocial Disorder in Adolescence



$P < .01$, CD Ss > No CD; No CD Ss = Controls

Developmental Sequence of Antisocial and Drug Use Disorders in Adolescence



- **Antisocial disorder started before Substance Disorders.**
- **Antisocial Disorder never started after Substance Disorders.**

- **In addition:**

**SUD was related to judicial
events**

Developmental Sequence of APD, SUD, and Arrests

Total N with lifetime diagnoses of APD and SUD = 29

In all (100%), APD preceded arrests

In 27/29 (93%), SUD preceded arrests

In 2/29 (7%) SUD started after arrests

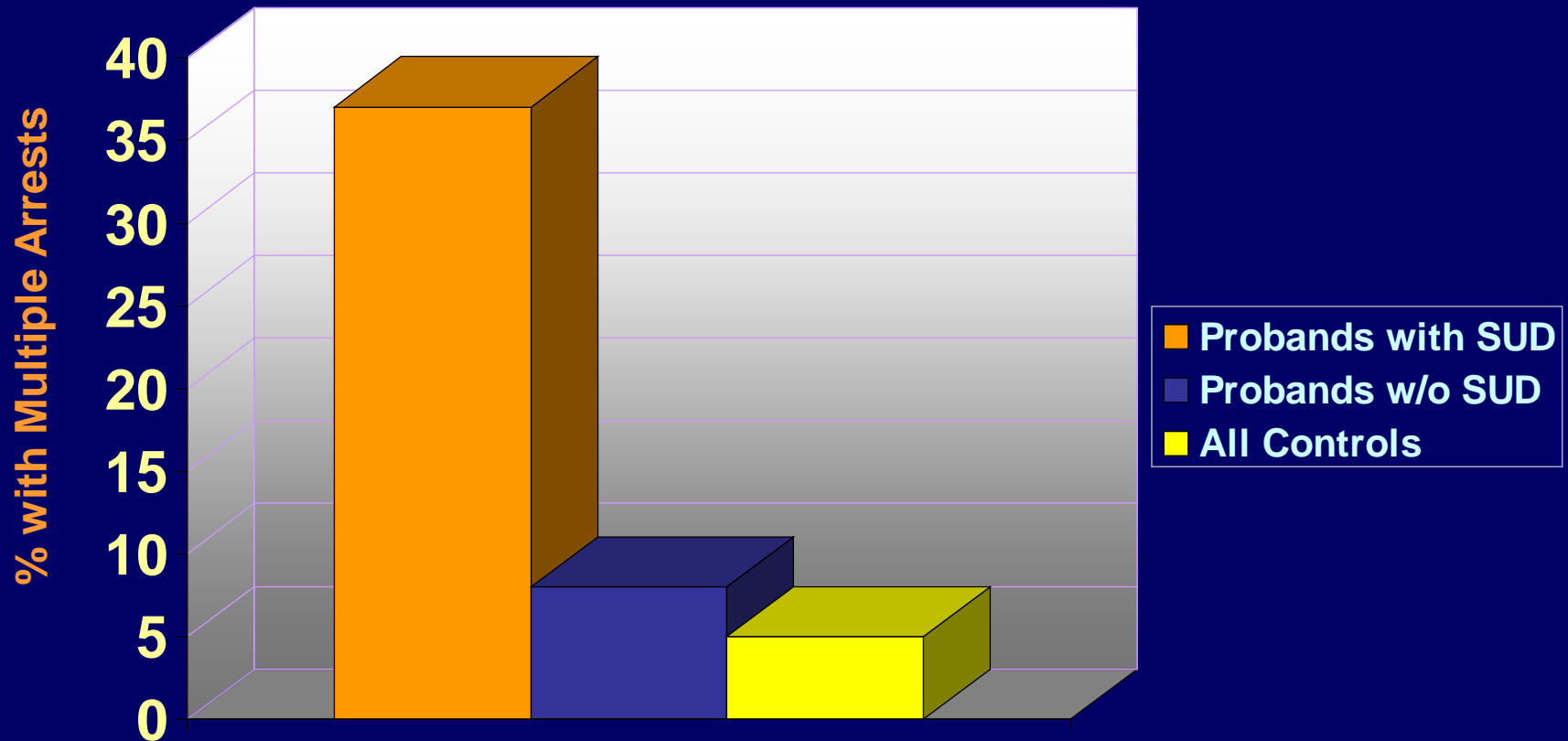
Sequential Development of Antisocial Personality Disorder (APD), Substance Use Disorder (SUD), and First Arrest in ADHD Probands

Sequence of Onset	%
APD → SUD → First Arrest	69%
[APD = SUD] → First Arrest	17%
APD → [SUD = First Arrest]	7%
APD → First Arrest → SUD	7%

APD → SUD: APD onset was at least 1 year earlier than SUD onset.

APD = SUD: Both developed within the same year.

% Multiple Arrests in Ss With and Without Substance Use Disorder (SUD)



Is elevated SUD due to greater drug exposure in children with ADHD?

NO

77% of probands

75% of controls,

had tried drugs

Developmental Cascade of Psychiatric Disorders

1. **Childhood ADHD**, on to
2. **Adolescent Antisocial Disorder**, on to
3. **Substance Use Disorder**, on to
4. **Criminality into adulthood**

How About At Age 41?

Total Follow-Up Duration:

M (SD) years 33 (2.0)

Minimum/Maximum: 28 -38

Mean Interval Since Last Follow-Up:

16 years

Comorbidity Since Age 25: ADHD, APD, & SUD -- Probands

Disorder	ADHD	
	YES %	NO %
APD**	43%	15%
SUD ^x	52%	32%
APD + SUD**	33%	11%

APD - Antisocial Personality Disorder (during Interval)

SUD - Non-Alcohol Substance Use Disorder (during the Interval,
ca. 16 years)

^xp < .10

**p < .01

Comorbidity of Current ADHD, Antisocial Personality Disorder, and Drug Use Disorders -- Probands

Current Disorder	ADHD*		χ^2	p (2-tail)
	YES (n =30) N (%)	NO (n = 105) N (%)		
Antisocial Personality Disorder	7 (23)	16 (15)	1.08	.30
Drug Use Disorder**	8 (27)	12 (11)	4.29	.04
Antisocial personality disorder <i>AND</i> Drug Use Disorder	4 (13)	4 (4)	3.80	.07

*Probable or definite ADHD excluding NOS. Excludes onset criterion **Excludes nicotine.

Fisher's Exact Test whenever cell count < 5

Comorbidity of Drug Use and Mood Disorders -- Probands

Mood Disorder (Since Age 25)	Drug Use Disorder*		χ^2	p (2-tail)
	YES (n = 48) n (%)	NO (n = 87) n (5)		
Mood Disorder	20 (42)	19 (22)	5.92	.02

*Excluding nicotine dependence. SUD predicts the incidence of mood disorders.

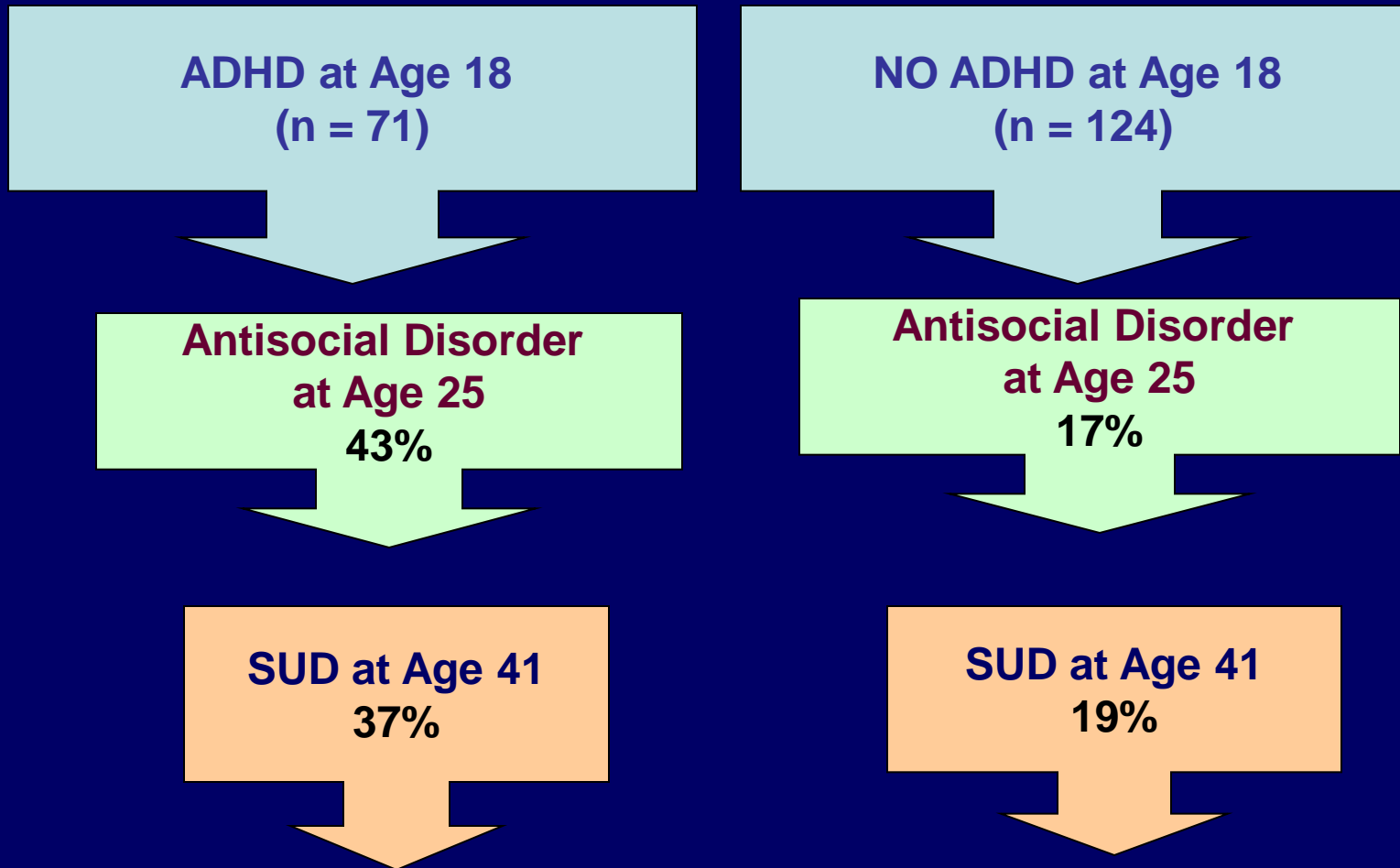
Drug Use Disorders: Number of Episodes and Duration (Since Age 25)

Drug Use Disorder Episodes*	Probands (n = 48) Mean (SD)	Controls (n = 19) Mean (SD)	<i>t</i>	<i>p</i> (2 tail)
<i>Number</i>	2.2 (1.2)	1.5 (0.8)	2.43	.02
<i>Duration (months)**</i>	146.2 (92.7)	124.0 (93.7)	0.87	.39

*Probable or definite diagnoses. Excludes nicotine dependence.

**Duration of episodes missing for 3 probands

Chronology of Ongoing ADHD Antisocial Disorder and SUD (Original N = 207)



SUD and Psychiatric Hospitalizations

Relationship to SUD	Hospitalized	
	Probands (n = 135) n (%)	Controls (n = 136) n (%)
Unrelated to substance use	8 (6)	4 (3)
Related to alcohol only	2 (1)	2 (1)
Related to drugs only	7 (5)	1 (1)
Related to alcohol and drugs	6 (4)	2 (1)
N (%) Subjects Hospitalized	20 (15)	7 (5)

Number of Psychiatric Hospitalizations and Their Relationship to SUD

Relationship to SUD	Probands (n = 20)		Controls (n= 7)	
	Mean (SD)	Range	Mean (SD)	Range
Unrelated to substance use	3.7 (6.6)	1 - 20	1.2 (0.5)	1 - 2
Related to alcohol only	4.5 (2.1)	3 - 6	2.0 (1.4)	1 - 3
Related to drugs only	2.4 (3.0)	1 - 9	1	---
Related to alcohol and drugs	2.5 (0.8)	1 - 3	1.0 (0)	1 - 1
Any of the above	3.6 (4.6) ⁺	1 - 20	1.7 (0.9)	1 - 3

⁺ p <.01

Relationship between Substance Use Disorder and Death

SUD	SUD Lifetime		SUD Since Mean Age 25	
	Probands (n = 14)* n (%)*	Controls (n = 5) n (%)	Probands (n = 4) n (%)	Controls (n = 3) n (%)
YES	6 (43%)	1 (20%)	3 (75%)	0
NO	8 (57%)	4 (80%)	1 (25%)	3 (100%)

* 1 proband is missing data

Investigators

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THANK YOU