

# Longitudinal Cognitive Changes among Methamphetamine Dependent Patients in Early Abstinence

## HYPOTHESIS:

Cognitive Deficits in  
Methamphetamine Users  
Worsen during Short Term Abstinence

# Longitudinal Changes - Subjects

- N=51 (Only 41 received follow-up)
- DSM-IV Methamphetamine Dependence
- No significant CNS medical history

# Longitudinal Changes - Subjects

- Mean Age=31.5 (SD=8.8)
- Male=70.6%
- White=92.2%
- Mean Years Education=10.8 (SD=1.8)
- Unemployed=90.2%
- Rx Medications=41.2%

# Longitudinal Changes - Subjects

<b>Substance Use Dependence (past year)</b>	<b>n</b>	<b>%</b>
Methamphetamine	51	(100.0)
Alcohol	14	(27.5)
Marijuana	14	(27.5)
Cocaine	7	(13.7)
Heroin	3	(5.9)
Hallucinogens	3	(5.9)
Club Drugs	2	(3.9)

# Longitudinal Changes - Subjects

- Days since last methamphetamine use prior to baseline
  - Mean=27.6 (SD= 30.2)
  - Median=11.0
  - Mode=7.0
- Days methamphetamine use past month
  - Mean=11.6 (SD=11.2)
- Days alcohol use past month
  - Mean=3.6 (SD=8.0)

# Longitudinal Changes - Procedures

Subjects were administered  
a neuropsychological test battery  
early in treatment (day 3-10)  
and 3 weeks later  
(interim mean=19.6 days, SD=2.8).

# MOTOR

	Baseline T-Score	Follow-up T- Score	
	<u>Mean±SD</u>	<u>Mean±SD</u>	<u>p</u>
<b>Grooved Pegboard Dominant</b>	44.6±11.4	53.6±14.3	<.001
<b>Grooved Pegboard Nondominant</b>	41.6±10.7	46.8±12.4	0.002
<b>Grip Strength Dominant</b>	46.0±10.4	48.6±10.5	0.053
<b>Grip Strength Nondominant</b>	45.4±11.1	47.9±12.2	0.087

# SPEED OF INFORMATION PROCESSING

	Baseline T-Score	Follow-up T- Score	
	<u>Mean±SD</u>	<u>Mean±SD</u>	<u>p</u>
<b>Digit Symbol</b>	44.1±8.7	47.6±8.5	<.001
<b>Symbol Search</b>	49.6±8.1	54.2±8.6	<.001
<b>Trail Making Test, Part A</b>	53.1±11.7	57.0±10.7	0.009

# EXECUTIVE FUNCTIONING/ ABSTRACTION

	Baseline T-Score	Follow-up T- Score	
	<u>Mean±SD</u>	<u>Mean±SD</u>	<u>p</u>
<b>Trails B Tsc</b>	48.8±10.9	54.6±12.4	<.001
<b>STROOP Word Tsc</b>	41.3±8.7	43.6±9.5	0.01
<b>STROOP Color Tsc</b>	42.6±9.1	43.5±8.4	0.195
<b>STROOP Color-Word Tsc</b>	42.8±9.4	46.7±8.8	<.001

# LANGUAGE-VERBAL FLUENCY

	Baseline T-Score	Follow-up T- Score	
	<u>Mean±SD</u>	<u>Mean±SD</u>	<u>p</u>
<b>Letter Fluency</b>	45.1±9.2	47.8±10.8	0.021
<b>Category Fluency</b>	44.8±10.6	48.9±9.0	<.001

# ATTENTION/WORKING MEMORY

	Baseline T-Score	Follow-up T- Score	
	<u>Mean±SD</u>	<u>Mean±SD</u>	<u>p</u>
<b>Letter-Number Sequencing</b>	45.4±7.5	46.0 ± 6.7	0.795
<b>Paced Auditory Attention Test</b>	41.3±10.8	45.8±13.5	<.02

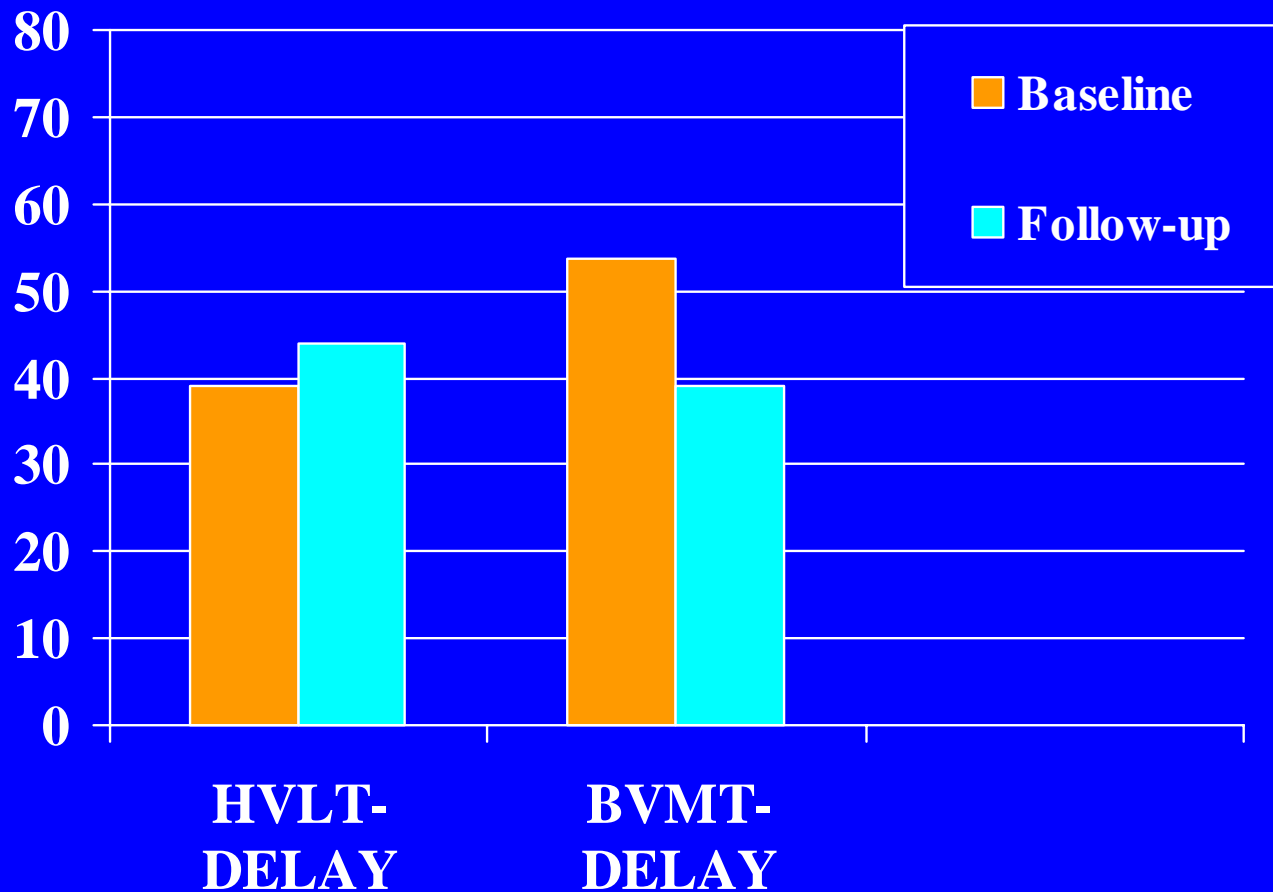
# Brief Visuospatial Memory Test

	Baseline T-Score	Follow-up T- Score	
	<u>Mean±SD</u>	<u>Mean±SD</u>	<u>p</u>
<b>Learning Total</b>	37.6±2.4	36.9±11.3	0.745
<b>Delayed Recall</b>	38.5±13.1	40.5±15.8	0.079
<b>% retained after delay</b>	87.3±17.4	91.9±10.6	0.043

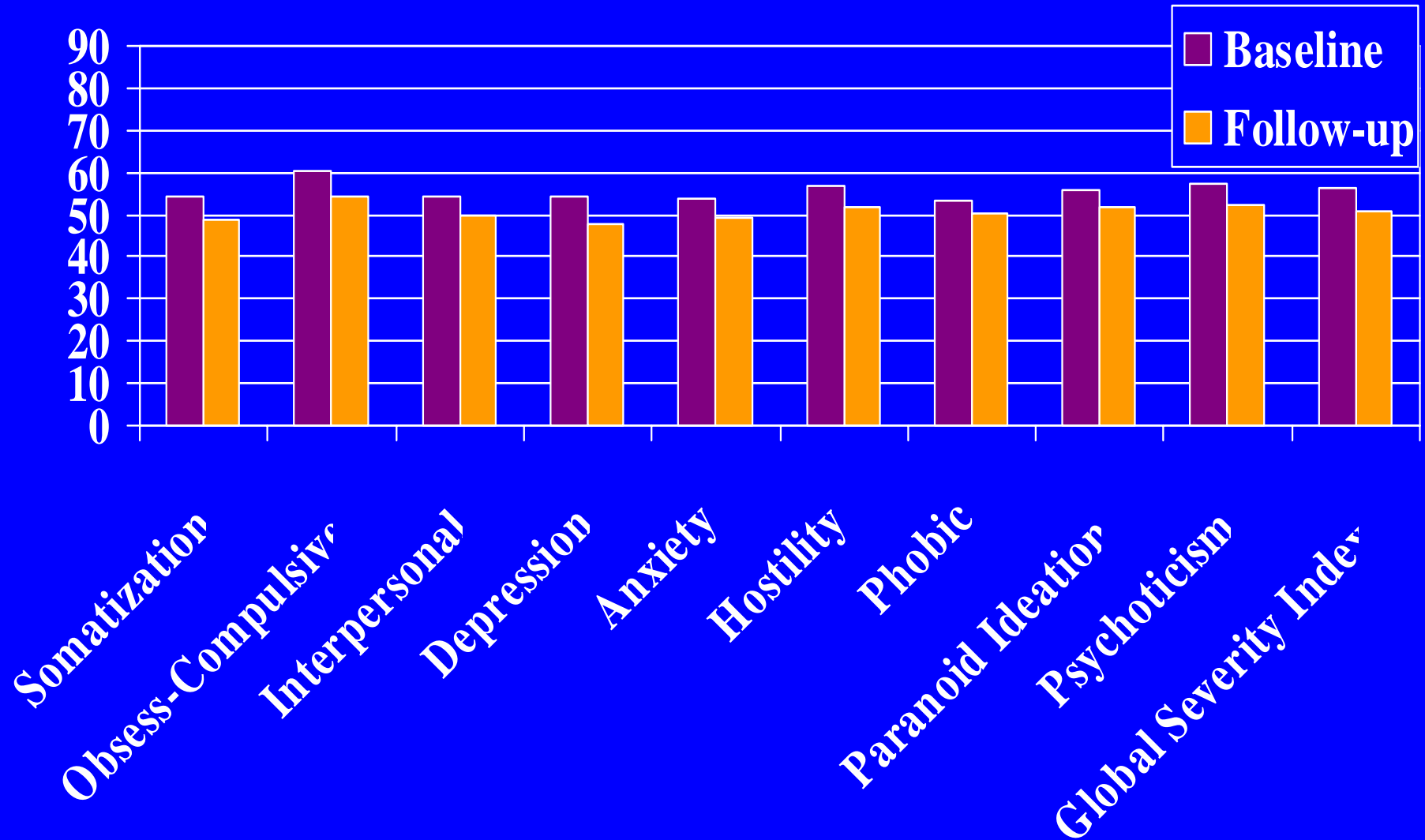
# Hopkins Verbal Learning Test

	Baseline T-Score	Follow-up T- Score	
	<u>Mean±SD</u>	<u>Mean±SD</u>	<u>p</u>
<b>Learning Total</b>	39.3±9.4	37.0±8.2	0.037
<b>Delayed Recall</b>	39.1±10.3	38.2±9.0	0.457
<b>% retained</b>	83.5±17.3	82.7±21.2	0.925

# Proportion Impaired on Verbal and Visuospatial Memory Tasks



# Brief Symptom Inventory (BSI) Subscale T-Scores at Baseline and 3-Week Follow-up (n=41)



# Longitudinal Changes

## Conclusions 1

- On average Methamphetamine dependent subjects in this study perform slightly below average on tests of:
  - Motor function
  - Abstraction
  - Information processing
  - Attention
  - Verbal Fluency
- But they generally improve on these measures with short-term abstinence

# Longitudinal Changes

## Conclusions 2

- On average methamphetamine dependent subjects in this study perform in the impaired range on tests of:
  - Visual Memory
  - Verbal Memory
- And they generally DO NOT improve on these measures with short-term abstinence

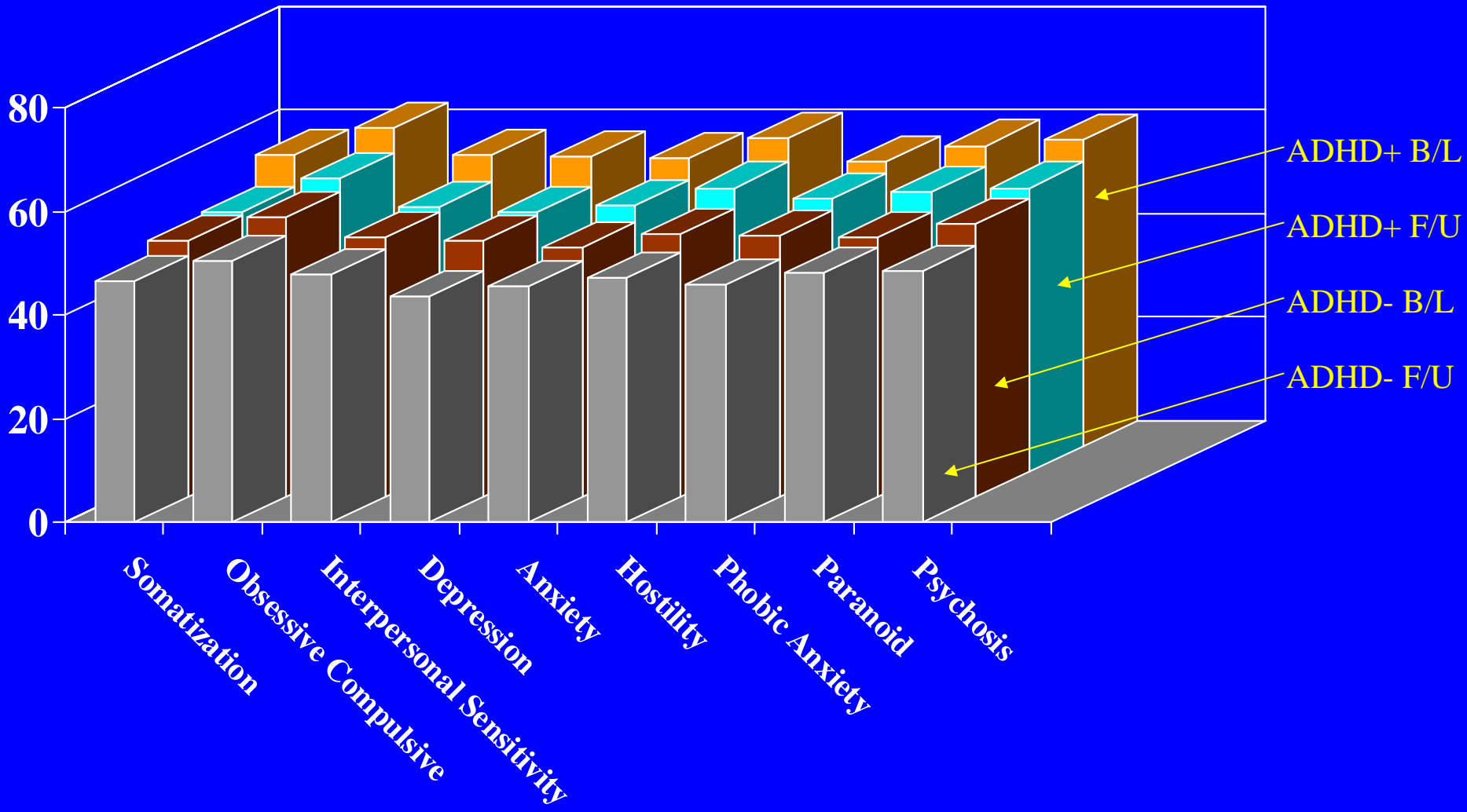
# Childhood ADHD based on Wender Utah Rating Scale

- n=36 (70.6%) screened positive for ADHD (WURS>46)

	<i>ADHD+</i>		<i>ADHD-</i>			
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	<u>t</u>	<u>p</u>
<b>WURS</b>	67.5	12.3	29.4	10.9	10.4	<.001
<b>MA Use past 30 d</b>	14.1	11.3	5.7	8.9	2.8	<.01

- n=10 subjects were lost to f/u, and all screened positive for ADHD (p=.024 Fisher's Exact Test)

# Baseline and F/U Psych Sx (BSI)



# Medical and Psychiatric Effects of Methamphetamine Abuse

## Conclusions

- MA Users (even at young age) are likely to present with and need coordinated intervention for:
  - Multiple medical problems
  - Drug induced and pre-existing psychopathology
  - Cognitive impairment
- Some problems may improve with abstinence, others may not

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