

Reducing risky behavior in older children and adolescents by treating ADHD

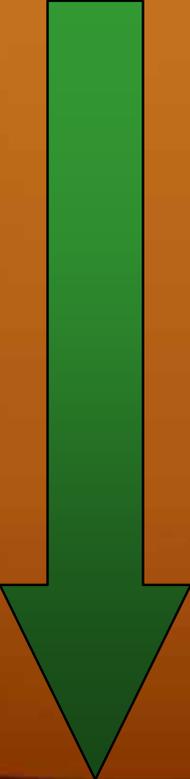
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ADHD Developmental Trends

Symptoms of ADHD decline and change
from childhood to adulthood

Children



- Motoric hyperactivity**
- Aggressiveness**
- Low frustration tolerance**
- Impulsiveness**
- Easy to distract**
- Inattentiveness**
- Shifting of activities**
- Easy to bore**
- Impatience**
- Restlessness**

Adults

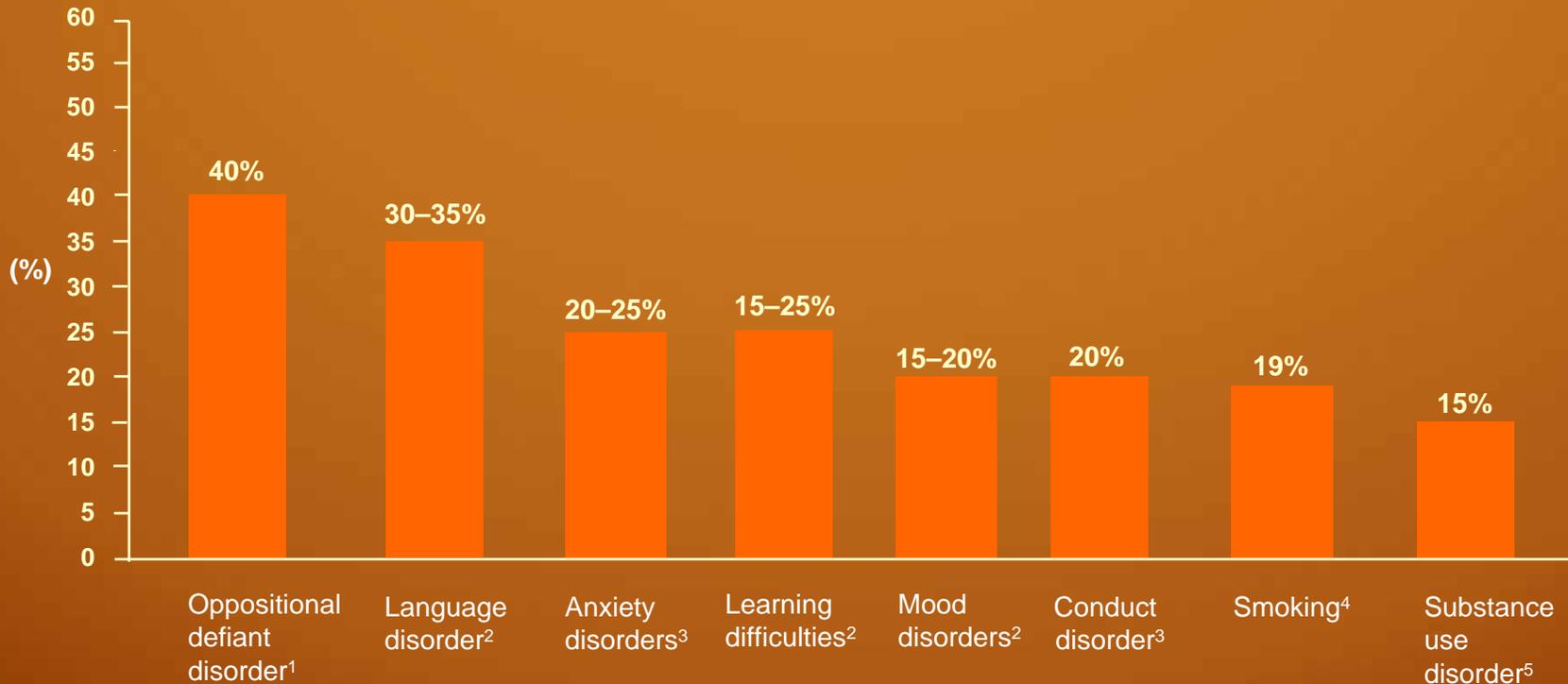
Serious risks develop in older children and adolescents with ADHD

- Risky driving and traffic accidents
- Drug/alcohol abuse and dependence
- Antisocial conduct, delinquency, arrest and incarceration

Risks are increased by comorbid conditions

- Early-onset Conduct Disorder plus ADHD carries the highest risk for lifelong antisocial behavior
- Conduct Disorder also increases the risk of drug abuse
- Learning Disabilities increases the odds of school drop-out

ADHD: Comorbid Conditions



¹MTA Cooperative Group. *Arch Gen Psychiatry* 1999; 56:1076–1086.

²Barkley R. *Attention-deficit Hyperactivity Disorder. A Handbook for Diagnosis and Treatment*, 2nd ed. New York: Guilford Press, 1993.

³Biederman J, et al. *Am J Psychiatry* 1991; 148:565–577.

⁴Milberger S, et al. *J Am Acad Child Adolesc Psychiatry* 1997;36:37–44.

⁵Biederman J, et al. *J Am Acad Child Adolesc Psychiatry* 1997;36:21–29.

Other risk factors

- Low socioeconomic status
- Below average IQ
- School failure
- Association with antisocial peers
- Synergistic effect of ADHD

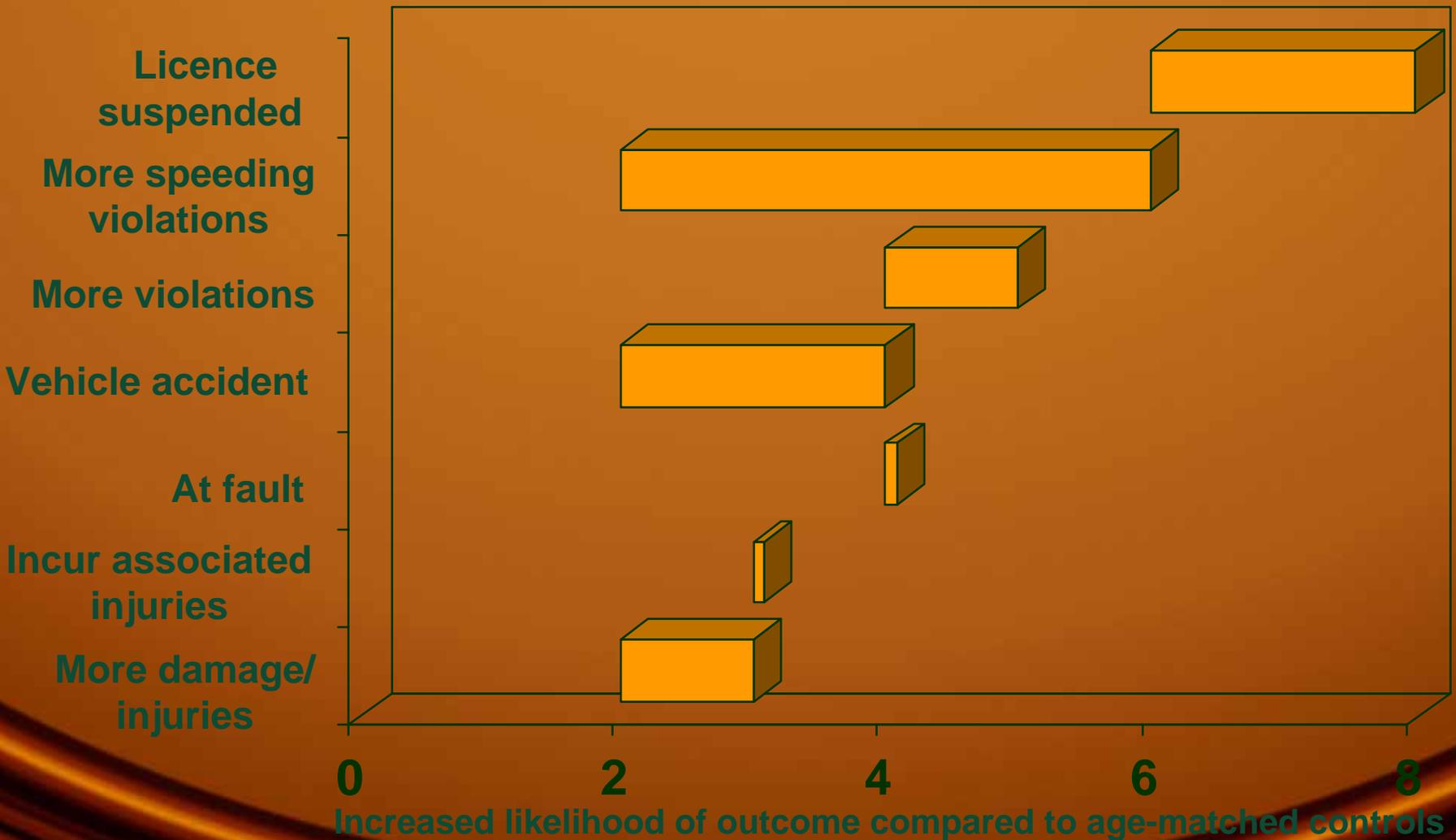
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Can treatment reduce “adolescent-onset” risks?

- *Can stimulants be useful in reducing the high rate of automobile accidents involving adolescents?*
- *Can stimulants reduce the risk of drug abuse? Or, do stimulants increase the risk for later drug use?*
- *Can stimulants reduce the risk of chronic antisocial behavior?*

Poor Driving Performance and ADHD

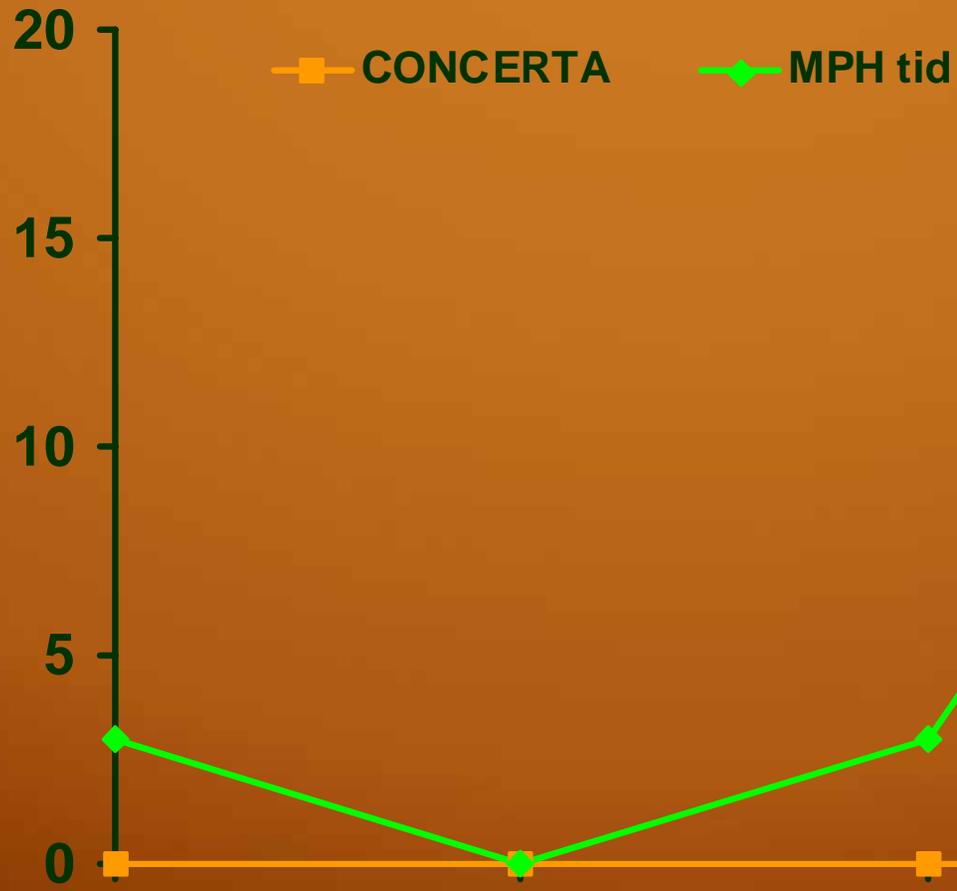


Barkley R et al. *Pediatrics* 1993;92:212–8; Cox D et al. *J Nerv Ment Dis* 2000;188:230–4

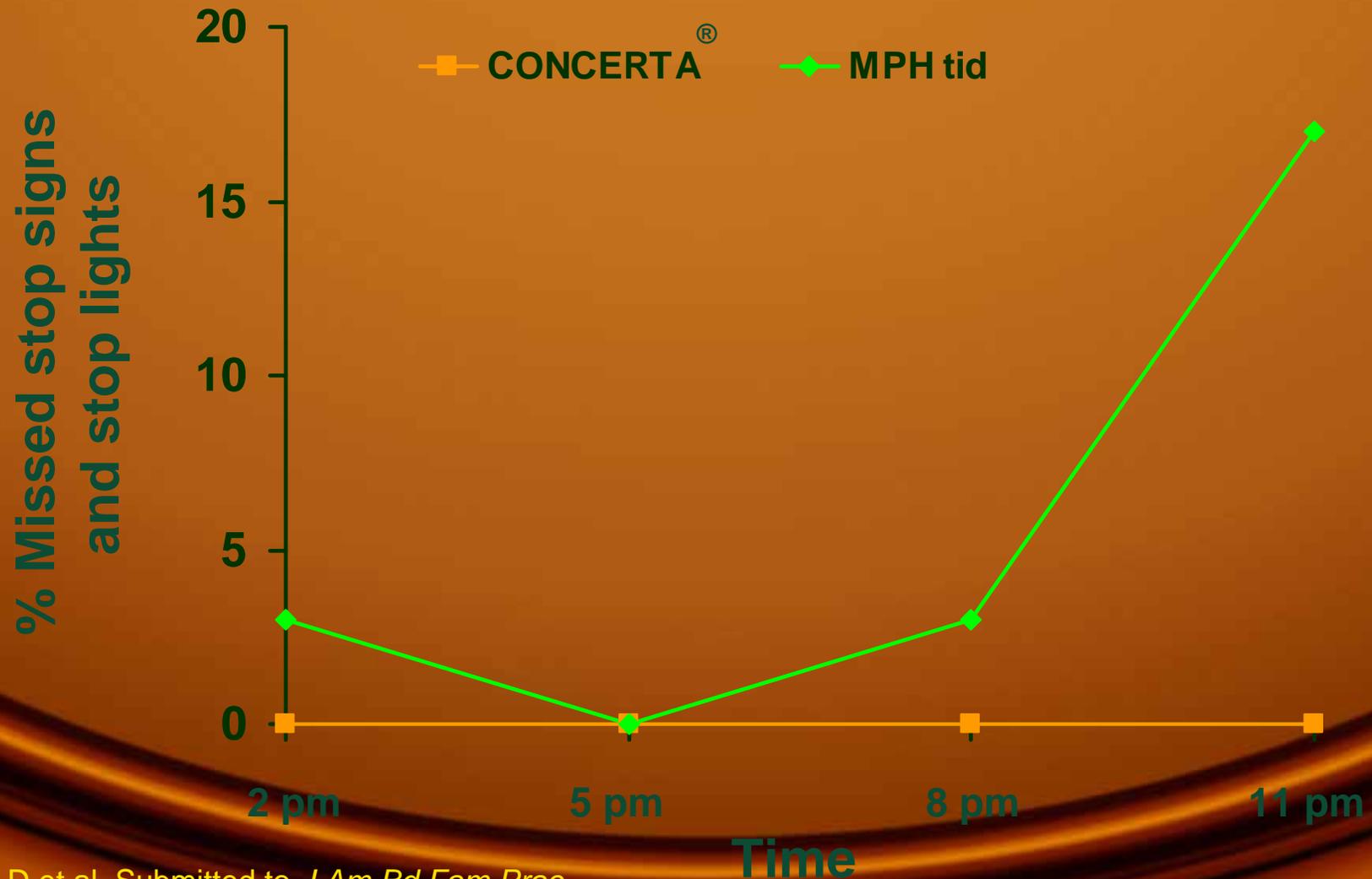
Barkley R et al. *Pediatrics* 1996;98:1089–95; Murphy K, Barkley RA. *Comp Psychiatry* 1996;37:393–401

Driving Study

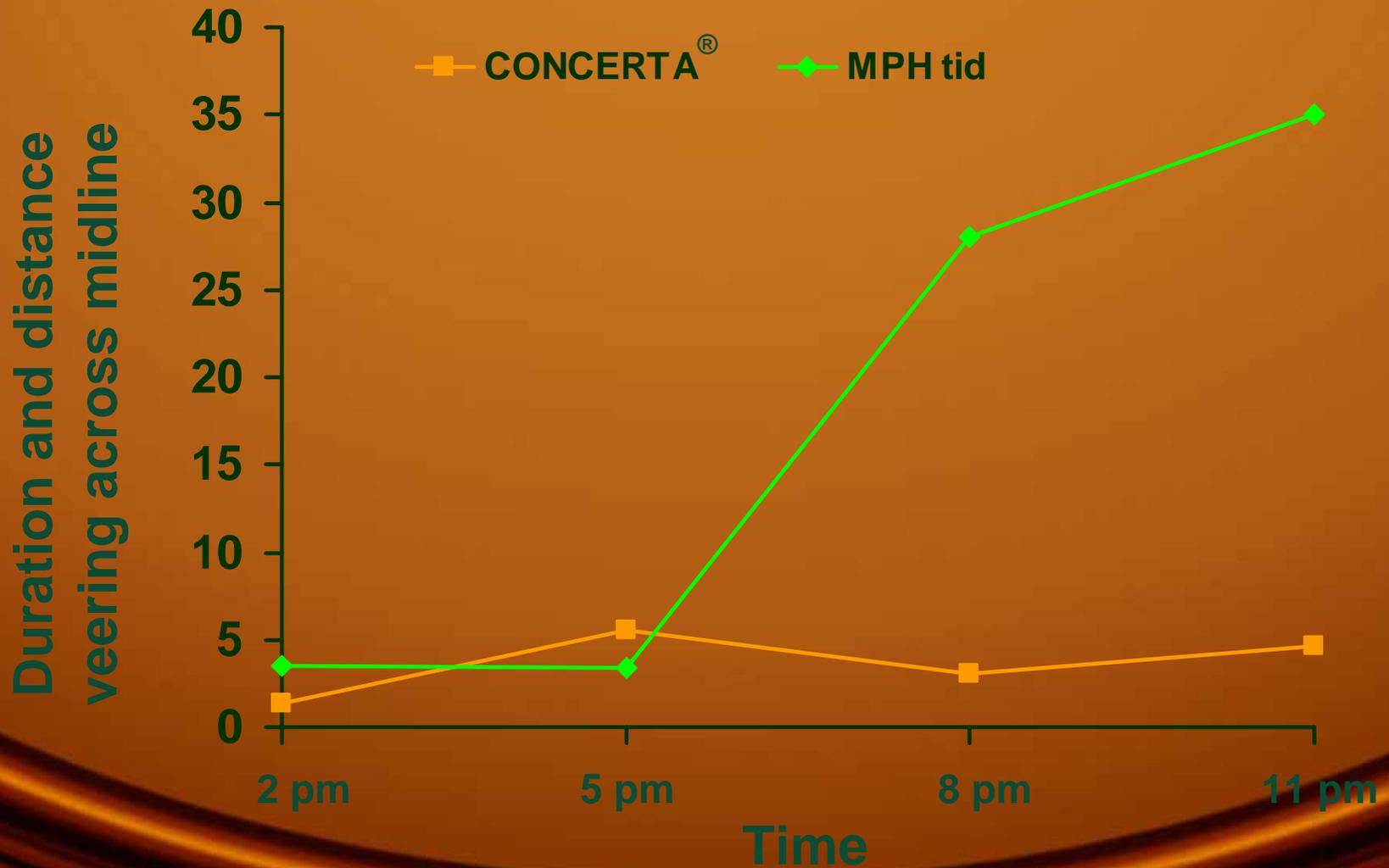
- **Design:**
 - Repeated measure, crossover study comparing simulated driving performance with once-daily CONCERTA[®] (8 am) to MPH tid (8 am, 12 noon, 4 pm)
 - Tested on Atari Research Driving Simulator at 2 pm, 5 pm, 8 pm, and 11 pm
 - Simulated 8-mile long typical grade 2 US highway



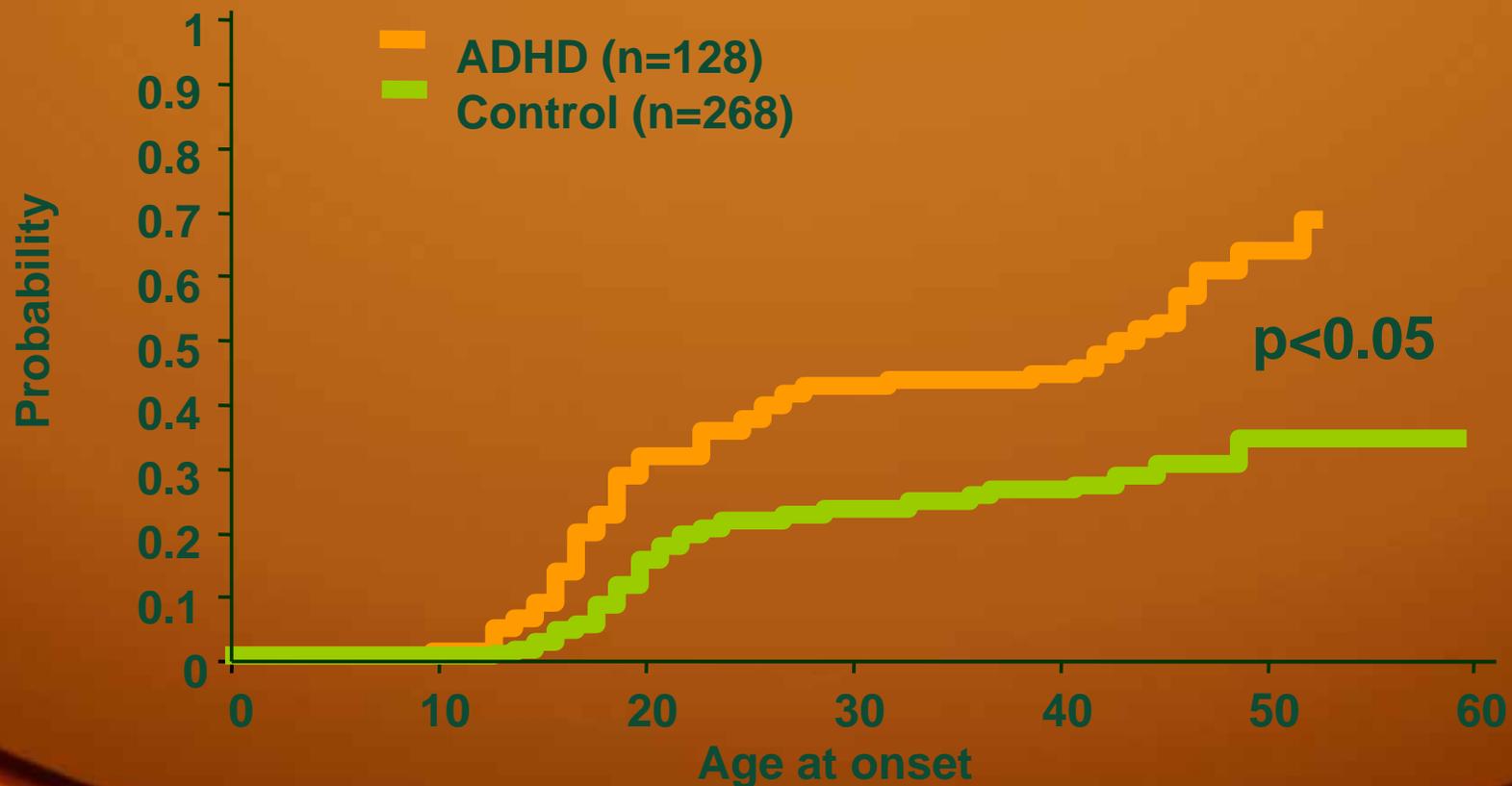
Driving Study: Missed Stops



Driving Study: Veering Across Midline

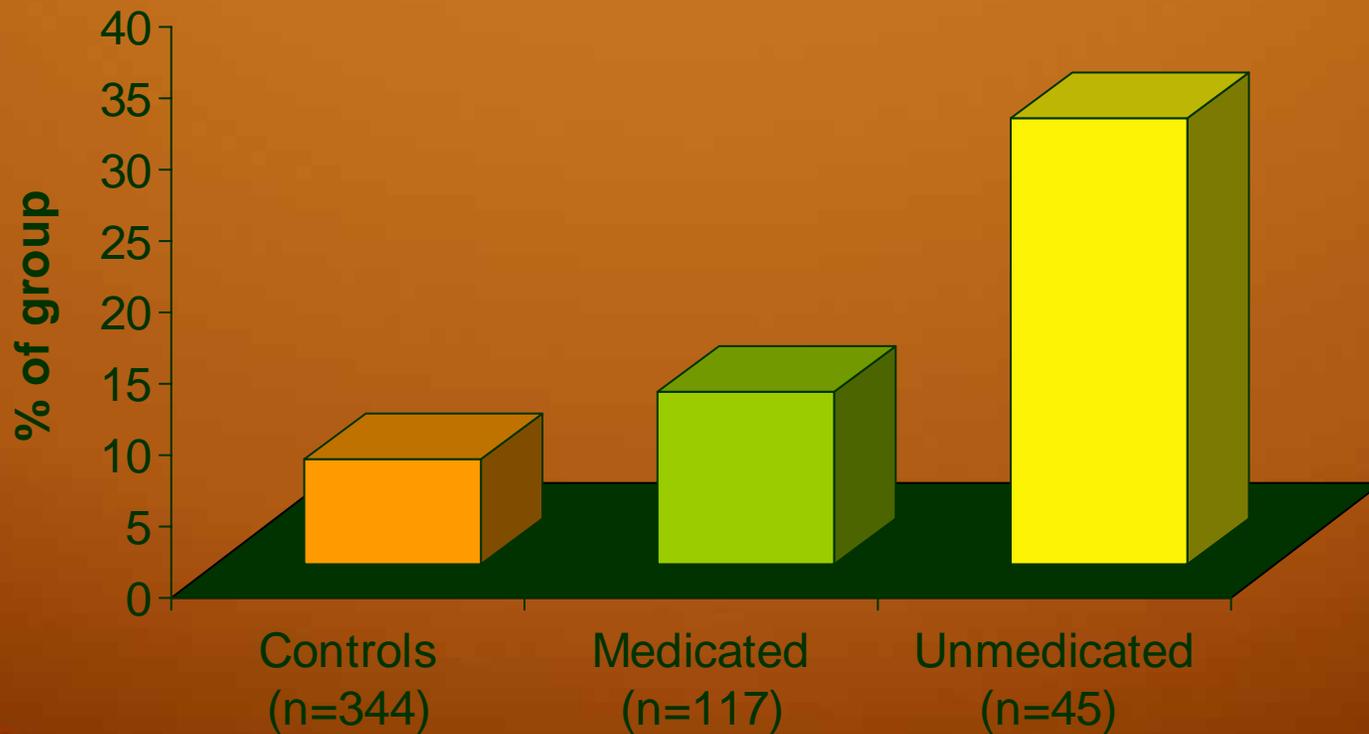


Onset of Substance Use in ADHD and Non-ADHD Adults



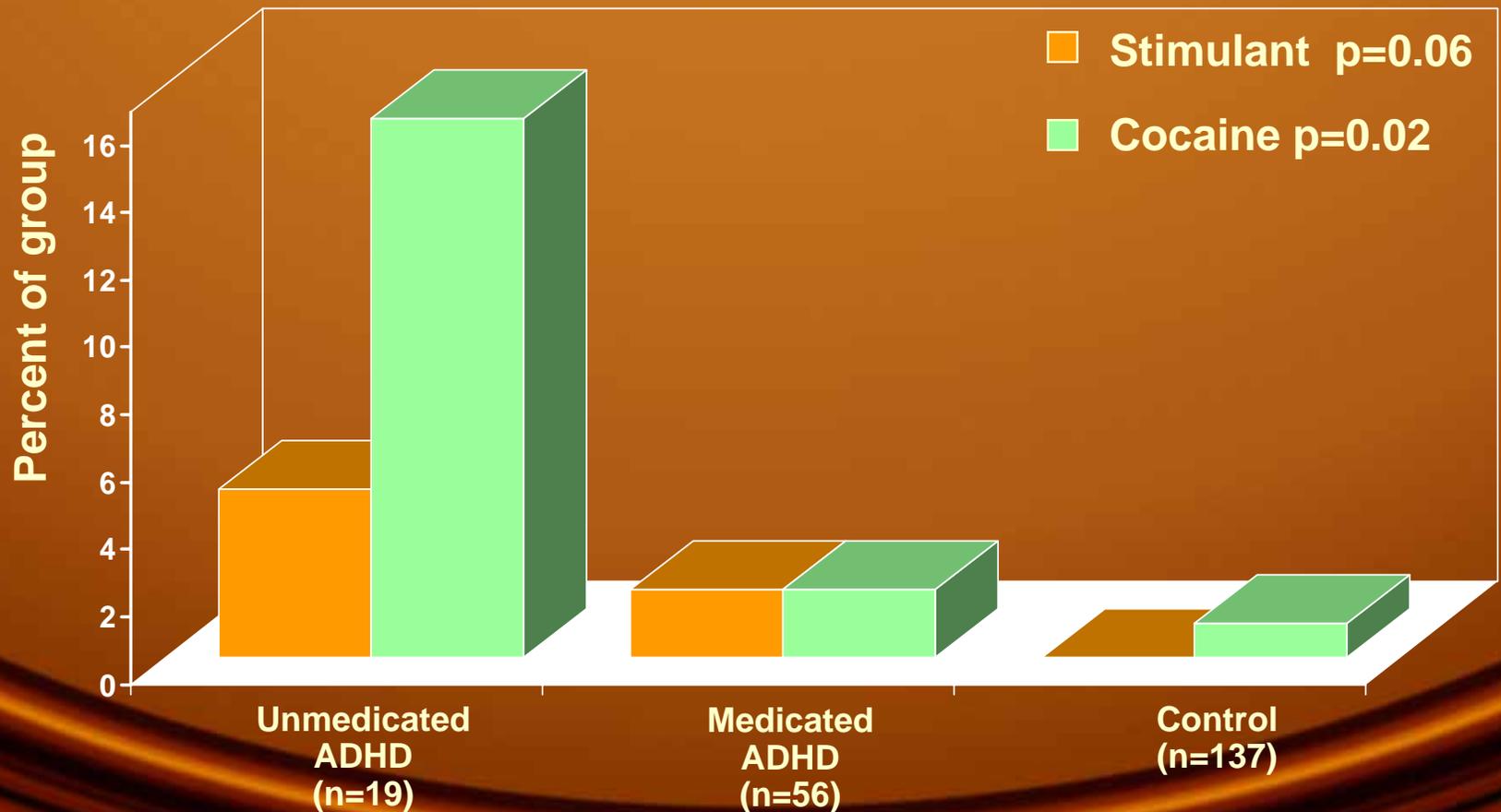
ADHD and Substance Use Disorder

Overall rate of Substance Use Disorder



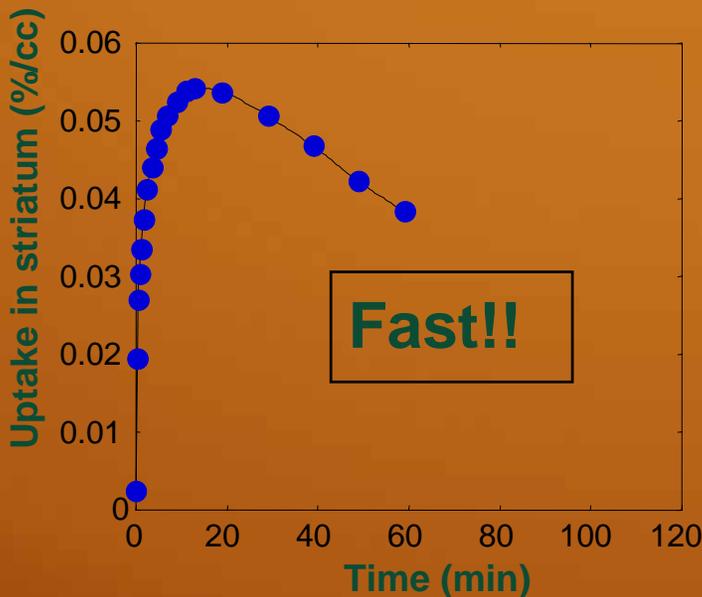
Biederman et al. Pharmacotherapy of attention-deficit/hyperactivity disorder reduces risk for substance use disorder. *Pediatrics* 1999; 104: E20

Possible protective effects of medication on substance abuse and dependence

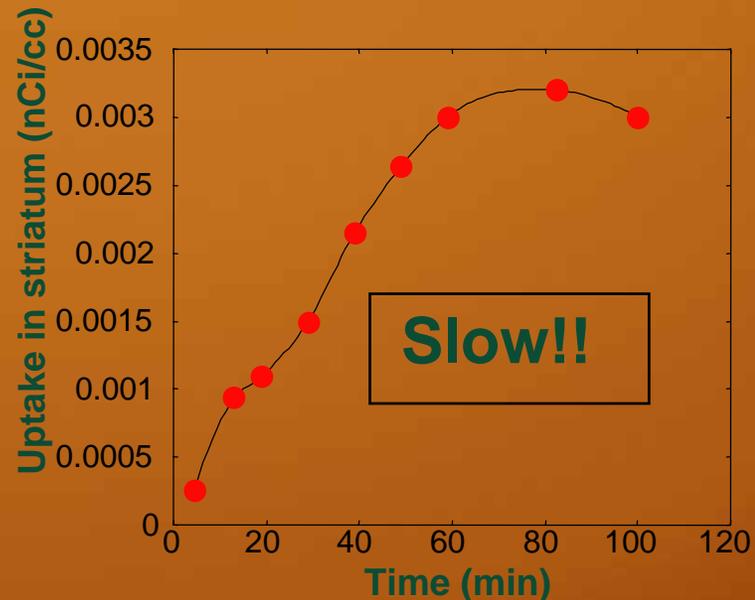


Rate of Drug Uptake into the Brain

IV MPH

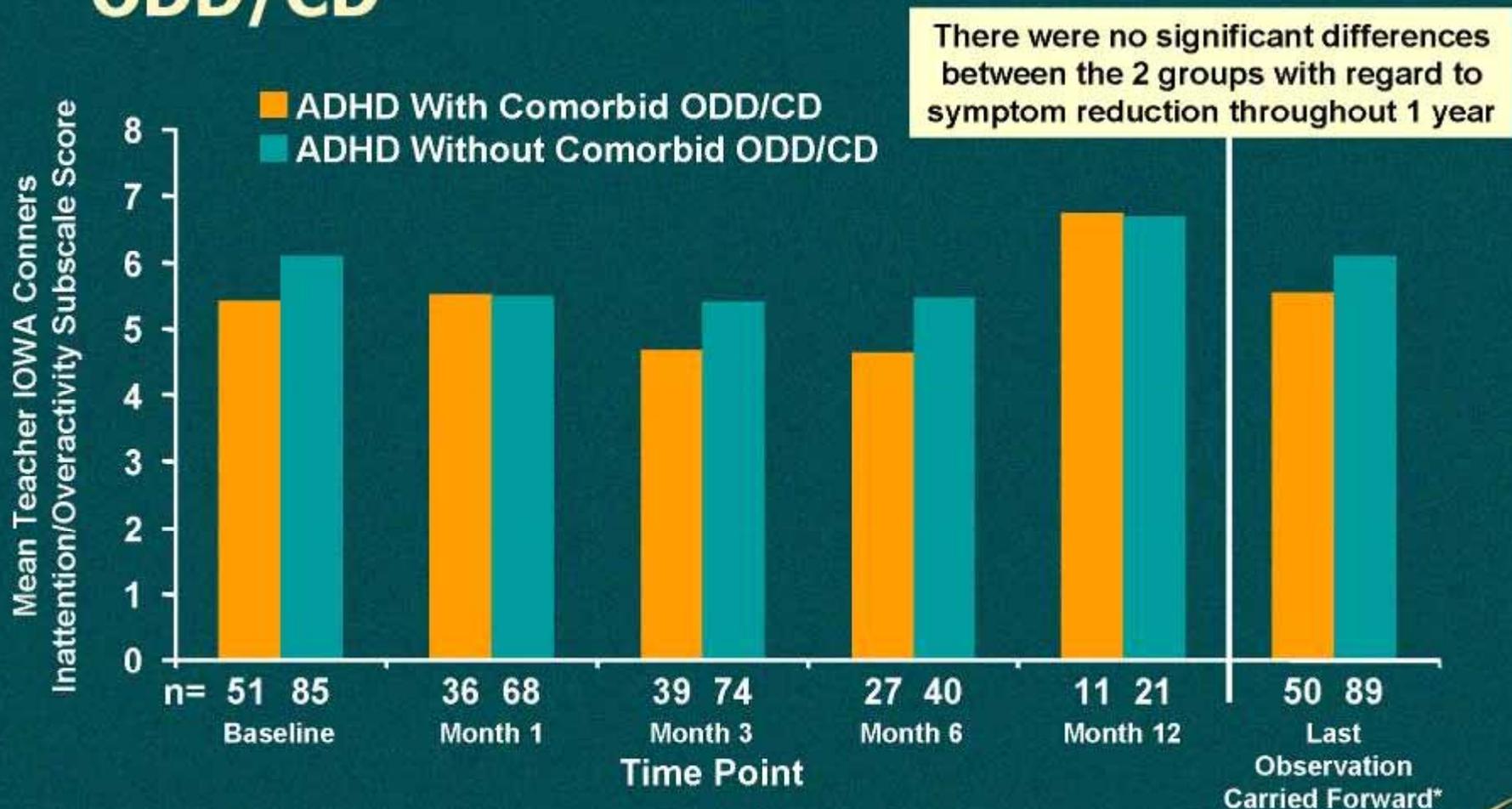


Oral MPH



- IV methylphenidate produces a “high” but oral methylphenidate does not
- The slow brain uptake of oral methylphenidate permits effective treatment without a “high”

CONCERTA®: ADHD Symptom Reduction in Children With and Without Comorbid ODD/CD



*Last observation carried forward results include early drop-outs during the first 12 months of the study.
 McBurnett K, et al. Poster presented at AACAP. October 2005.



Medication for severe CD

- Medication of CD is understudied
- Generally targeted toward managing reactive aggression, explosive temper, hostile-negative mood, and/or comorbid ADHD
- Stimulants (amphetamine and methylphenidate, or Ritalin) help to manage ADHD (which exacerbates SPCD) and also may directly reduce aggression