ADHD: Assessment and Treatment across the Lifespan*

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Question 1

- Which of the listed disorders is the most common co-morbidity with ADHD in children?
  - A-Learning disorders in Math
  - B-Learning disorders in expressive language
  - C-Oppositional defiant disorder
  - D-Separation anxiety disorder
  - E-Gender Identity Disorder of Childhood

Question 2

- Which of the following adverse events have been reported with atomoxetine in adults?
  - A-Sexual side effects
  - B-Stevens-Johnson syndrome
  - C-Bradycardia
  - D-Hypotension
  - E-None of the above

Question 3

- A diagnosis of ADHD in adults must include?
  - A-Retrospective history of ADHD symptoms before the age of 12 years
  - B- History of school failure
  - C- History of motor vehicle accidents
  - D- History of failed multiple marriages
  - E- History of substance abuse

Question 4

- Which of the following statements about bupropion is true?
  - A-It should not be used in youth with a history of seizure disorder
  - B-It should not be used in youth with a history of eating disorder
  - C-It can be associated with serum sickness
  - D-it has off-label use for ADHD
  - E-All of the above

Question 5

- Which 2 of the following instruments are useful in diagnosing adult ADHD?
  - A-CAARS
  - B-CARS
  - C-BAARS
  - D-WRAADS
  - E-CARBS

Preview*

- History of ADHD
- Subtypes of ADHD and co-morbidities
- NE and DA pathways
- MTA study
- Medication Treatments for pediatric ADHD
- Adult ADHD

Teaching Points*

- ADHD is a *clinical* diagnosis in both youth and adults
- There are several subtypes that have different presentations
- The drugs of choice are psychostimulants and atomoxetine, but there are several other medications that can be effective

ADHD*:

- Clinical characteristics:
  - *some combination of* severe inattention, hyperactivity, and impulsivity that begins in childhood, and often persists into adult yrs.
  - *Must cause functional impairment across settings, and must be developmentally relevant*
  - some symptoms should be present before age 7

Attention-Deficit Hyperactivity Disorder (ADHD)

- minimum brain dysfunction, hyperkinetic syndrome of childhood (1960s)
- 1980 DSM III: ADD(H)
- 1987 DSM IIIR: ADHD
- 1994 DSM IV: Subtypes
  - must meet 6 of 9 criteria in a particular category
    - Inattentive type (IA)
    - Hyperactive-Impulsive type (HI)
    - Combined type (CT)

ADHD in Childhood:

- Epidemiology
  - 3-7% of school-age children
  - boys 4-9x > girls

ADHD-Inattentive type

- Failure to pay close attention to details / frequent careless mistakes
- Difficulty sustaining attention in tasks or play
- Not listening when spoken to
- Not following through on instructions, and failure to finish tasks (schoolwork, chores). Not due to oppositionality or failure to understand

ADHD-Inattentive type

- Difficulty organizing tasks and activities
- Avoidance of tasks that require sustained mental effort
- Losing things necessary for tasks (toys, assignments, books)
- Easily distracted by external stimuli
- Often forgetful in daily activities

ADHD- Hyperactive/Impulsive type

- Fidgets with hands/ feet, or squirms in seat
- Leaves seat in classroom or other situations where sitting is expected
- Runs or climbs excessively in inappropriate situations
- Difficulty playing or engaging in leisure activities quietly
- Often "on the go" / "driven by a motor"
- Talks excessively

ADHD- Hyperactive/Impulsive type

- Impulsivity
  - Blurts out answers before questions have been completed
  - Difficulty waiting turn
  - Interrupts or intrudes on others (conversations, games)

Other criteria

- Some impairing symptoms were present before age 7
- Some impairment ***across settings*** (home, school)
- ***Clinically significant*** impairment in social, academic or work functioning
- Other conditions must be considered as source of symptoms

ADHD*

- Co-existing conditions must also be evaluated for
  - 30-50% of ADHD may be co-morbid with other dx
    - Oppositional Defiant Disorder (ODD)- Pervasive pattern of negativistic, defiant, disobedient, and hostile behaviors toward authority figures
    - Conduct Disorder (CD)- Repetitive pattern of violating the basic rights of others/ major age-appropriate social norms or rules are violated
    - Mood disorders (depression/bipolar disorder)- check family history!
      - Poor outcome in co-morbid teens (higher risk for suicide)
    - Anxiety Disorders- 25% or more
    - Learning Disorders- up to 60% in non-PCP settings
      - Especially Reading Disorder

Practice Guidelines*

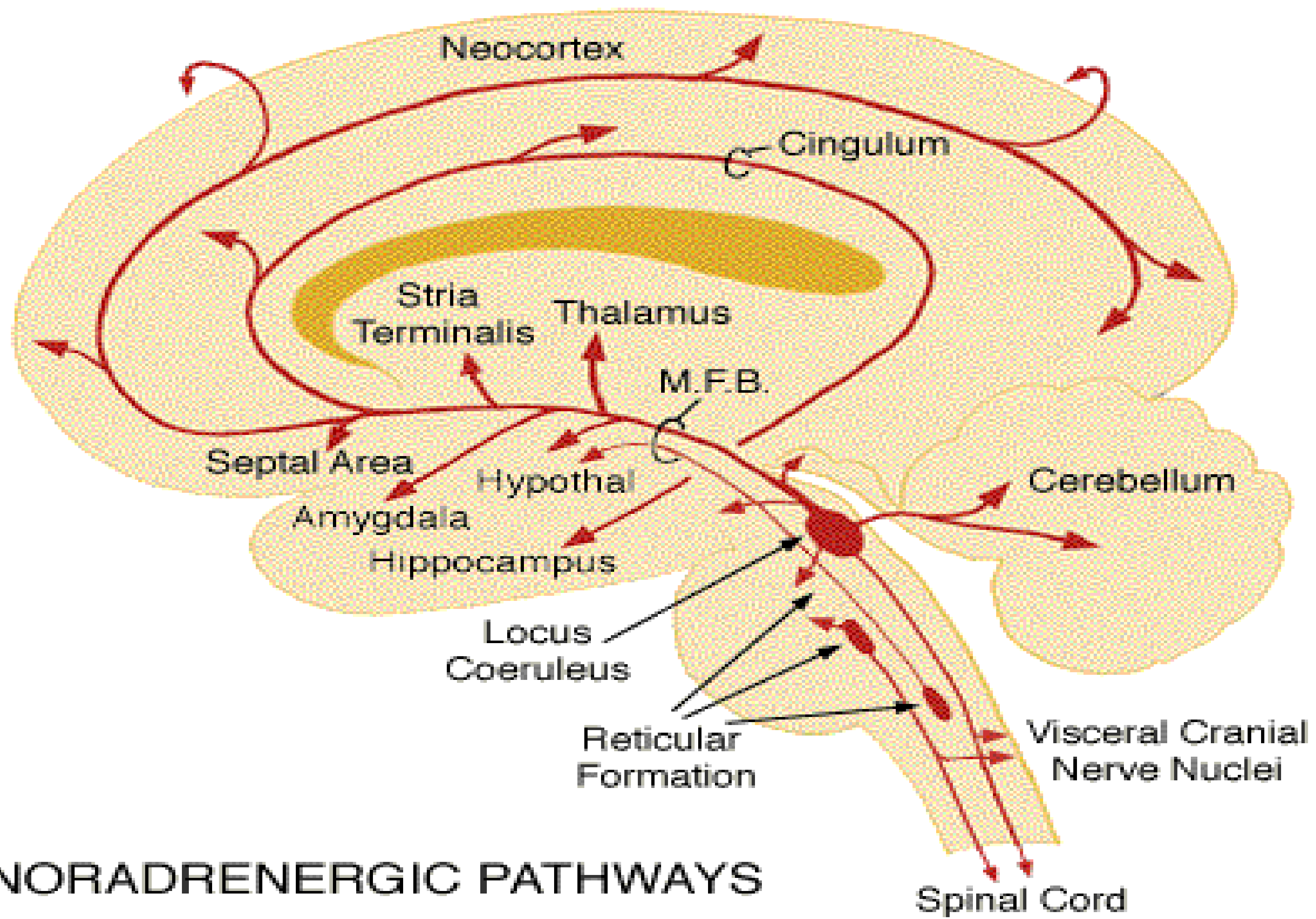
- In children who have good primary care, other diagnostic tests are not *routinely* indicated
  - EEG's indicated only if a history of seizure d/o or clinically significant lapses in consciousness exists
  - Continuous Performance Tests (CPT's) are useful in research settings only
    - measures of vigilance / distractibility which have low odds ratios in differentiating children with and without ADHD

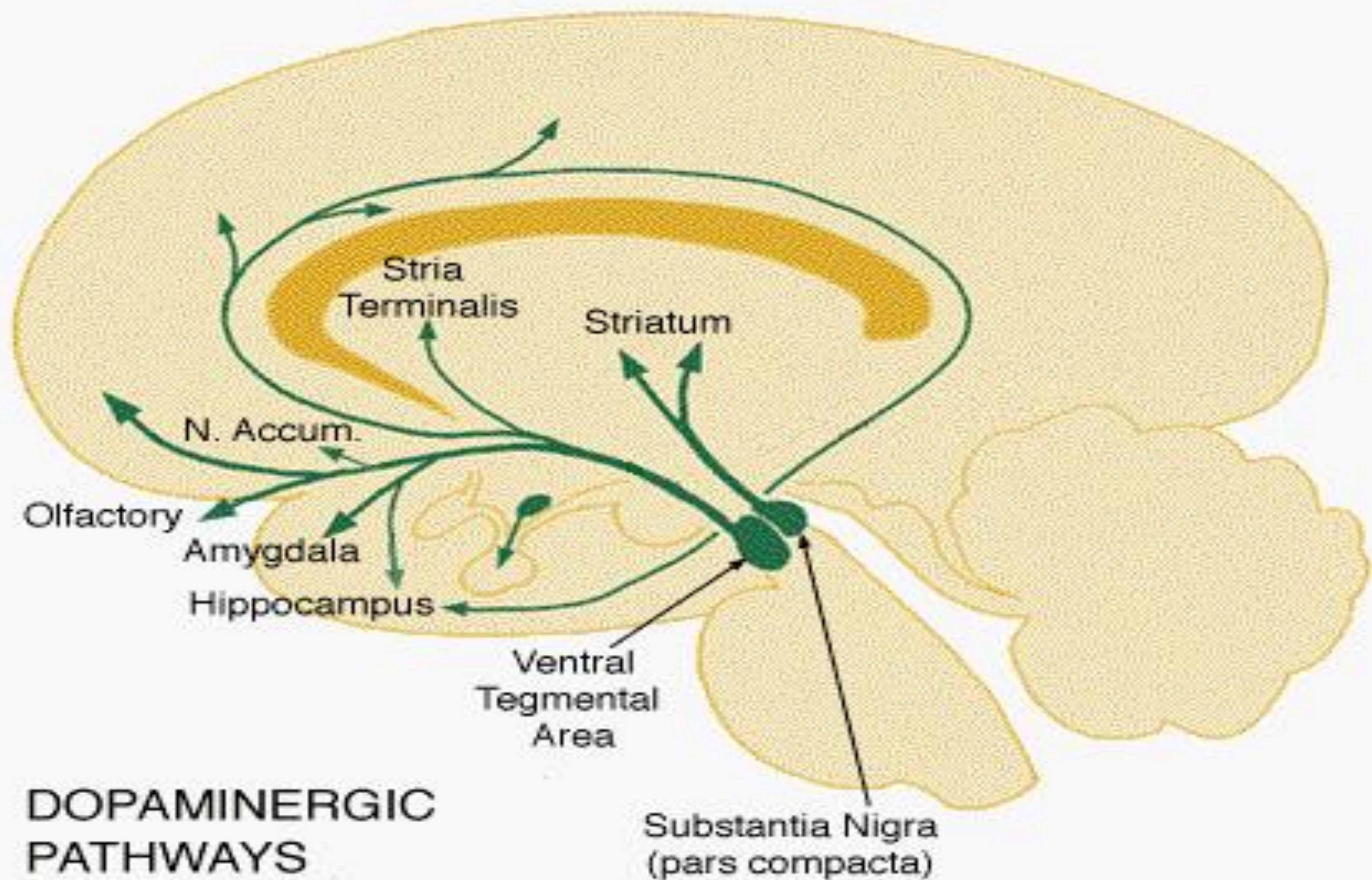
Practice Guidelines*

- Summary
  - Use explicit criteria for diagnosis
  - Obtain history from more than 1 setting
    - sx must be severe enough to cause functional impairment
  - Screen for co-existing conditions
- May need 2-3 visits for full work-up
  - parent and teacher questionnaires may be faxed for efficiency
    - Connor's scales, other ADHD rating scales

Heterogenous condition, many causes*

- Final common pathway
  - factors include:
    - brain structure / functional abnormalities
    - family / genetic factors
    - prenatal / perinatal factors
      - Maternal smoking and alcohol use
    - neurotoxins
    - psychosocial stressors and combined factors


Neocortex
Cingulum
Stria
Terminalis
Thalamus
M.F.B.
Septal Area
Hypothal
Amygdala
Hippocampus
Cerebellum
Locus
Coeruleus
Reticular
Formation
Visceral Cranial
Nerve Nuclei
Spinal Cord
NORADRENERGIC PATHWAYS


Stria
Terminalis
Striatum
N. Accum.
Olfactory
Amygdala
Hippocampus
Ventral
Tegmental
Area
Substantia Nigra
(pars compacta)
DOPAMINERGIC
PATHWAYS

Neuroimaging*

- MRI
  - Loss of the normal L > R asymmetry, smaller brain volumes of specific structures, esp. L caudate, smaller white matter vol of R frontal lobe
    - PFC, BG--both rich in DA receptors
      - 5-10% decrease in volume
    - Decreased volume of anterior-superior hemisphere
  - 5% decrease in R cerebellar volume, 4% reduction in intracranial volume; Unaffected siblings: up to 9% decrease in selected prefrontal and occipital areas
      - Durston, et al (2004): *J Amer Acad Child Adol Psychiatry*; 43(3); 332-340

Legal Rights of the Student and Obligations of the School District* (adapted from Robin, 1998)

- IDEA, Part B (1990)
  - This law entitles student to an Individualized Education Plan (IEP) as part of a "Special Education" plan
- Section 504 of the Rehabilitation Act of 1973
  - This law entitles student to classroom modifications in the mainstream classroom (not "Special Ed")
- Americans with Disabilities Act (1990)
- For excellent up-to-date discussions of Special Education laws, including the No Child Left Behind Act, IDEA, and Section 504, see
  - www.schwablearning.org

IDEA, Pt B*

- Requires public schools in the US to provide a ***free and appropriate education*** for all children with disabilities
  - Evaluation must show that the child has one or more specific mental or physical impairments, and these must be severe enough to warrant special education

IDEA, Pt B*

- Children/ teens with ADHD may get special ed services under 3 categories:
  - Specific LD
  - Emotional disturbance (ED)
  - Other health impaired (OHI)

Section 504*

- Rehab Act of 1973: A civil rights law that prohibits discrimination, in fed. funded programs, solely based on disabilities, for otherwise qualified persons.
- No specific disability categories
  - Broadly defines disability as a “physical or mental impairment which limits one or more life activities”, including learning.