Assessment of ADHD in Children and Adolescents

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Financial Disclosures

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IES	X							
UW			X					
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DSM-5 ADHD Criteria

- A. Six symptoms of IN and/or HI (5 in individuals 17 or older) from a list of 9 IN and 9 HI symptoms
- B. Several symptoms present prior to age 12
- C. Several symptoms present in two or more settings
- D. Clear evidence that symptoms cause significant impairment
- E. Symptoms are not better explained by another mental disorder or substance use

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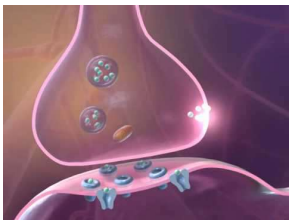
Biological underpinnings

- Reduced dopaminergic synaptic markers associated with ADHD
  - DRD4
  - DAT-1
  - D2/D3 receptors
  - Diminished anticipatory dopamine firing in reward circuits
- Hypoactivity in pre-frontal regions and fronto-striatal reward circuitry



Dickstein et al., 2006; Hoogman et al., 2013; Tripp & Wickens, 2008; Volkow et al., 2009;

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Similar associated cognitive deficits across lifespan

- Impaired executive functions
  - Response inhibition
  - Sustained attention
  - Working memory
  - Reaction time
- Impaired reward sensitivity
  - Delay aversion
  - Risky decision making
- Difficulties executing goal-directed behaviors

Castellanos, 2006; Faraone et al., 2014; Shulz et al., 2004, 2006; Toplak et al., 2009; Wilcutt et al., 2005

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ADHD is Behavioral, not Cognitive

a. Often **fails to give close attention** to details or makes careless mistakes in schoolwork, at work, or during other activities (e.g., overlooks or misses details, work is inaccurate).

b. Often has **difficulty sustaining attention** in tasks or play activities (e.g., has difficulty remaining focused during lectures, conversations, or lengthy reading).

c. Often **does not seem to listen** when spoken to directly (e.g., mind seems elsewhere, even in the absence of any obvious distraction).

d. Often **does not follow through on instructions** and fails to finish schoolwork, chores, or duties in the workplace (e.g., starts tasks but quickly loses focus and is easily sidetracked).

e. Often has **difficulty organizing tasks and activities** (e.g., difficulty managing sequential tasks; difficulty keeping materials and belongings in order; messy, disorganized work; has poor time management; fails to meet deadlines).

f. Often **avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort** (e.g., schoolwork or homework; for older adolescents and adults, preparing reports, completing forms, reviewing lengthy papers).

g. Often **loses things** necessary for tasks or activities (e.g., school materials, pencils, books, tools, wallets, keys, paperwork, eyeglasses, mobile telephones).

h. Is often **easily distracted by extraneous stimuli** (for older adolescents and adults, may include unrelated thoughts).

i. Is often **forgetful** in daily activities (e.g., doing chores, running errands; for older adolescents and adults, returning calls, paying bills, keeping appointments).

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ADHD is Behavioral, not Cognitive

a. Often **fidgets** with or taps hands or feet or squirms in seat.
b. Often **leaves seat** in situations when remaining seated is expected (e.g., leaves his or her place in the classroom, in the office or other workplace, or in other situations that require remaining in place).
c. Often **runs about or climbs** in situations where it is inappropriate. (Note: In adolescents or adults, may be limited to feeling restless).
d. Often **unable to play or take part in leisure activities quietly.**
e. Is often **"on the go" acting as if "driven by a motor"** (e.g., is unable to be or uncomfortable being still for extended time, as in restaurants, meetings; may be experienced by others as being restless or difficult to keep up with).
f. Often **talks excessively.**
g. Often **blurts out** an answer before a question has been completed (e.g., completes people's sentences; cannot wait for turn in conversation).
h. Often has **trouble waiting his/her turn** (e.g., while waiting in line).
i. Often **interrupts or intrudes** on others (e.g., butts into conversations, games, or activities; may start using other people's things without asking or receiving permission; for adolescents and adults, may intrude into or take over what others are doing).

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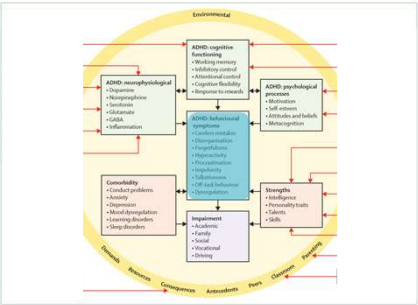
ADHD is More than Cognition: What makes ADHD behavioral symptoms emerge clinically?



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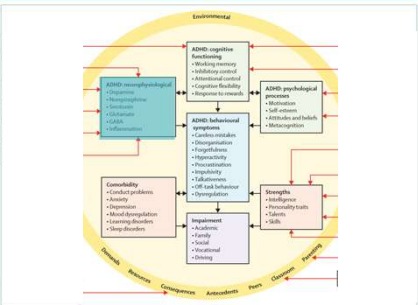
What makes ADHD symptoms emerge clinically?



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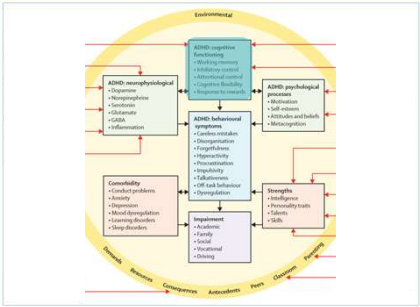

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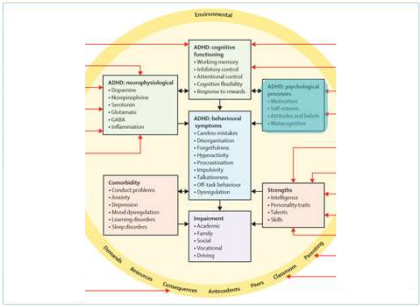

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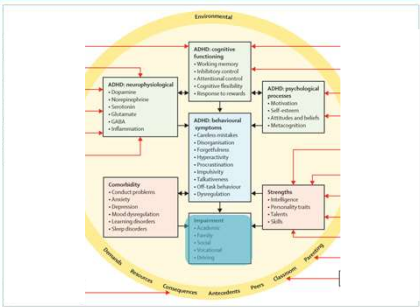

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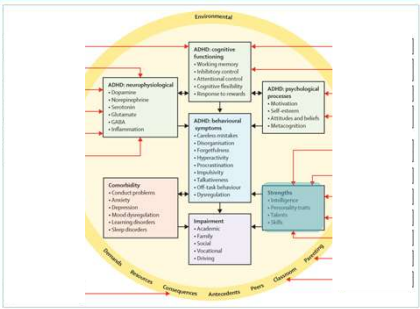
What makes ADHD symptoms emerge clinically?



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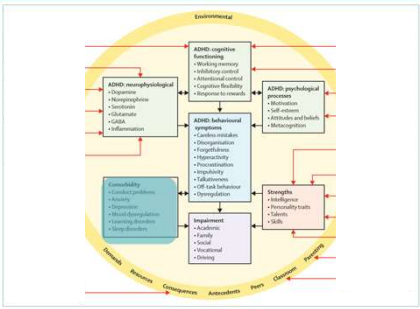
What makes ADHD symptoms emerge clinically?



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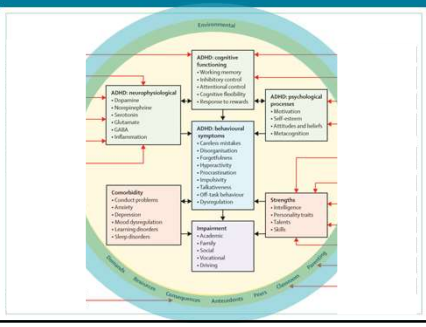

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Age-based heterogeneity in clinical presenting problems

- Early childhood
  - Non-compliance with adult instructions
  - Behavioral dysregulation
  - Motor overactivity
- Middle Childhood
  - Hyperactivity, inability to stay seated during school work
  - Aversive social interactions with peers
  - Distractibility
  - Difficulty following rules
- Adolescence
  - Organization, time management, and planning problems
  - Speaking without thinking
  - Problems with motivation and self-directedness
  - Poor follow through with daily responsibilities
- Adulthood
  - Difficulties managing appointments, finances, and job responsibilities
  - Problems with attention and procrastination
  - Failing to finish things started

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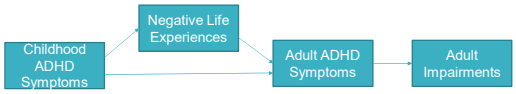
Why ADHD is important to detect: one of biggest risk factors for adult maladjustment



Molina et al., 2012, 2013

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Children with ADHD Diagnosis

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Persistence of ADHD into Adulthood

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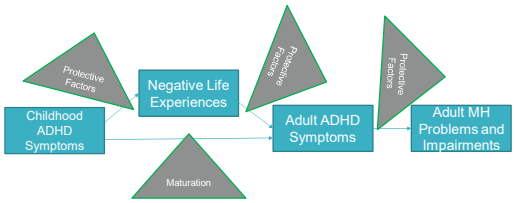
Mitigating Factors in Childhood/Adolescence



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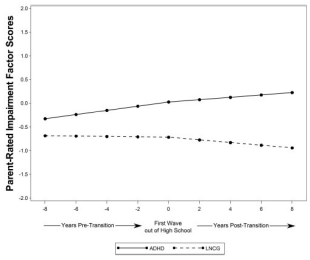
Why do we care about detecting childhood ADHD?



Multimodal Treatment Study of ADHD (Howard et al., 2016)

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ADHD and Transition to Adulthood

- 11x risk to be both unemployed and not in school at age 19
- Among college students with ADHD: at risk for course failure and dropout
- More frequent employment changes and firings
- Lower wage earning and supervisor ratings- lifetime earnings 40% less
- More likely to live with family
- Less likely to have a savings account or credit card
- Higher rates of food and housing instability
- Lower life satisfaction
- Higher rates of depression
- Heavier use of substances, especially marijuana

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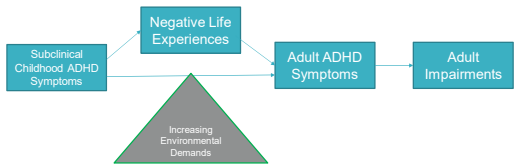
Late-Identified/Late-Diagnosed ADHD



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Who is likely to demonstrate later-onset impairment trajectories?

- Girls/women
- Individuals with high intelligence/strengths that help compensate
- Those with comorbid anxiety

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Who is likely to be *missed* in childhood?

- Ethnic/racial minority children
  - (problems may be misattributed to conduct disorder)
- Inattentive subtype (problems don't bother others)
- Some individuals with very supportive parents/support structures
- Children with socioeconomic disadvantages (lower contact with mental health systems)

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Diagnostic Methodological Choices

- How to screen
- Which symptoms you assess
- How strict is your symptom threshold?
- Impairment requirements
- Which measures to assess ADHD
- Whom to ask about symptoms
- How to assess childhood ADHD symptoms in adolescents?
- How to rule out comorbidities
- What to do if source of disorder appears to be ongoing stress/trauma or other environmental factors?
- How pervasive should symptoms be (setting and time)?
- How to combine discrepant reports from multiple informants

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American Academy of Pediatrics Practice Parameters on ADHD Screening/Diagnosis

KASs
KAS 1: Initiate an evaluation for ADHD for any child or adolescent age 4 years to the 18th birthday who presents with academic or behavioral problems and symptoms of inattention, hyperactivity, or impulsivity.
KAS 2: To make a diagnosis of ADHD, determine that DSM-5 criteria have been met, including documentation of symptoms and impairment in more than 1 major setting (ie, social, academic, or occupational), with information obtained primarily from reports from parents or guardians, teachers, other school personnel, and mental health clinicians who are involved in the child or adolescent's care. Rule out any alternative cause.
KAS 3: In the evaluation of a child or adolescent for ADHD,include a process to at least screen for comorbid conditions, including emotional or behavioral conditions (eg, anxiety, depression, oppositional defiant disorder, conduct disorders, substance use), developmental conditions (eg, learning and language disorders, autism spectrum disorders), and physical conditions (eg, tics, sleep apnea).

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Best Practices: Screening

META-ANALYSIS

Systematic Review and Meta-analysis: Screening Tools for Attention-Deficit/Hyperactivity Disorder in Children and Adolescents

Melissa Mulraney, PhD, Gonzalo Arrondo, PhD, Hande Musullulu, MPsych, Iciar Iturmendi-Sabater, MPsych, Samuele Cortese, MD, Samuel J. Westwood, PhD, Federica Donno, PhD, Tobias Banaschewski, MD, Emily Simonoff, MD, Alessandro Zuddas, MD, Manfred Döpfner, PhD, Stephen P. Hinshaw, PhD, David Coghill, MD

Drs. Mulraney and Arrondo shared first authorship of this article.

Key Take Aways

- No screening tools for ADHD are great.
- ADHD is too complicated for simple screeners to be sufficient for accurate diagnosis.
- Options with most evidence:
  - Strengths and Difficulties Questionnaire (Free)
  - Child Behavior Checklist (Proprietary)
- Consider:
  - Using impairment items as a part of screening

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From Gordon et al., 2006: MGH Longitudinal Study

Articles

Symptoms Versus Impairment

The Case for Respecting *DSM-IV*'s Criterion D

Michael Gordon
Kevin Antshel
Stephen Faraone
Russell Barkley
Upstate Medical University
Larry Lewandowski
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James J. Hudziak
University of Vermont
Joseph Biederman
Harvard Medical School at the Massachusetts General Hospital
Charles Cunningham
McMaster University

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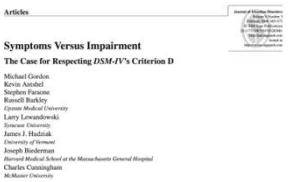

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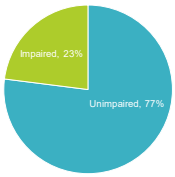

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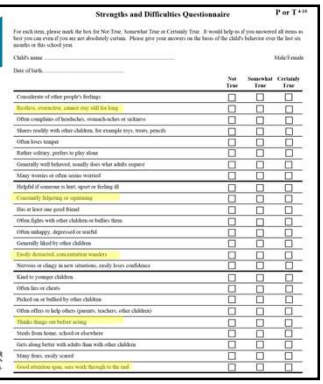
Screener Example: Strengths and Difficulties Questionnaire



Strengths and Difficulties Questionnaire P or T 4-16

For each item, please mark the box for Not True, Somewhat True or Certainly True. It would help us if you answered all items as best you can even if you are not absolutely certain. Please give your answers on the basis of the child's behavior over the last six months or this school year.

Child's name _____ Male/Female

Date of birth _____

	Not True	Somewhat True	Certainly True
Considerate of other people's feelings	☐	☐	☐
Restless, overactive, cannot stay still for long	☐	☐	☐
Often complains of headaches, stomach-aches or sickness	☐	☐	☐
Shares readily with other children, for example toys, treats, pencils	☐	☐	☐
Often loses temper	☐	☐	☐
Rather solitary, prefers to play alone	☐	☐	☐
Generally well behaved, usually does what adults request	☐	☐	☐
Many worries or often seems worried	☐	☐	☐
Helpful if someone is hurt, upset or feeling ill	☐	☐	☐
Constantly fidgeting or squirming	☐	☐	☐
Has at least one good friend	☐	☐	☐
Often fights with other children or bullies them	☐	☐	☐
Often unhappy, depressed or tearful	☐	☐	☐
Generally liked by other children	☐	☐	☐
Easily distracted, concentration wanders	☐	☐	☐
Nervous or clingy in new situations, easily loses confidence	☐	☐	☐
Kind to younger children	☐	☐	☐
Often lies or cheats	☐	☐	☐
Picked on or bullied by other children	☐	☐	☐
Often offers to help others (parents, teachers, other children)	☐	☐	☐
Thinks things out before acting	☐	☐	☐
Steals from home, school or elsewhere	☐	☐	☐
Gets along better with adults than with other children	☐	☐	☐
Many fears, easily scared	☐	☐	☐
Good attention span, sees work through to the end	☐	☐	☐

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Screening with Interview

- Can use an ADHD screener built into an interview (like K-SADS Screener) if conducting a comprehensive interview anyway
- https://pediatricbipolar.pitt.edu/sites/default/files/assets/Clinical%20tools/KSADS/KSADS_DSM_5_SCREEN_Final.pdf
- Page 29 of KSADS Screener

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Best Practices: DSM-A Criteria

A. Six symptoms of IN and/or HI (5 in individuals 17 or older) from a list of 9 IN and 9 HI symptoms

- *Choices:*
  - Who are your informants? (Parent, Teachers, Self, other adults)
  - How will you assess?
- *Best practices:*
  - Use at least two informants (that can observe to multiple settings)
  - Consider conducting a clinical interview for optimal thoroughness
  - Use empirically validated DSM—based rating scales
  - Combine reports using an "or" rule

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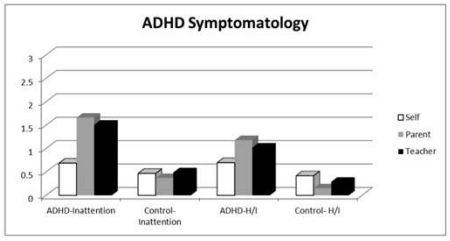
Who to Use as Informant?



Sibley et al., 2012, *Journal of Consulting and Clinical Psychology*

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Who to Use as an Informant?

- Who has had the most extensive opportunities to observe the youth?
- Which teachers witness the difficulties being reported?
- Who has known the youth for an extended period of time?
  - Teachers should have taught them for at least a month….
- Adolescents: self-report can be helpful to gauge insight and consider youth perspectives

- Challenges:
  - Teacher ratings—sometimes the nice teacher who will return the rating isn't the one witnessing the bulk of challenges
  - Consider making an online form or survey to obtain teacher ratings electronically

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Instruments

- DSM-based Rating Scales (FREE):
  - Vanderbilt: https://nichq.org/wp-content/uploads/2024/09/NICHQ-Vanderbilt-Assessment-Scales.pdf
  - SNAP: https://www.shared-care.ca/files/Scoring_for_SNAP_IV_Guide_26-item.pdf
  - DBD-Rating Scale: https://ccf.fiu.edu/research/index.html
- Interviews (FREE):
  - KSADS: https://www.pediatricbipolar.pitt.edu/clinical-services/clinical-tools
  - DBD-Interview: https://ccf.fiu.edu/research/_assets/disruptive-behavior-disorders-parent-interview.pdf

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How to combine across reporters?

- An "or" rule has the most research support for avoiding misdiagnosis:
  - Count a symptom if present if endorsed by any informant
  - Overdiagnosis will be curbed by requirement that impairment also be present

DSM Symptom Based on Application	K-SADS	Parent SNAP	Teacher SNAP	Endorsed
Inattention				
Easily distracted				
Fails to finish things started / Difficulty following instructions				
Difficulty sustaining attention				
Doesn't listen				
Loses things necessary for activities				
Makes a lot of careless mistakes				
Avoids/dislikes tasks the require sustained mental effort				
Disorganized / Difficult organizing tasks				
Forgetful / Forgetful in daily activities				
Hyperactivity / Impulsivity				
Fidgets / Squirms				
Difficulty remaining seated				
Difficulty awaiting turn				
Blurts out answers before the question in completed				
Difficulty playing quietly				
Talks excessively				
Interrupts or intrudes on others				
Runs/climbs excessively				
"On the go" or "Driven by motor"				
# of Inattention Symptoms Determined by Clinician	0			
# of Hyperactivity-Impulsivity Symptoms Determined by Clinician	0			
Currently Taking Medication				
If Yes, What Medication (dosage)				
Past diagnosis				

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What about cognitive tasks of attention? (Do not use in ADHD diagnosis)

- Examples:
  - Qb test (FDA approved)
  - CPT (Conners CPT)
  - Delis-Kaplan (DKEFS)
- Measure cognitive abilities that ***only correlate partially*** with behavioral ADHD symptoms
- Do not have adequate psychometric properties for detecting ADHD (many false negatives—high IQ people can ace these tests—and false positives—sleepy people, depressed people, etc, can fail these tests)
- Create diagnostic confusion
- Costly, burdensome (do not add information to what's caught on behavioral checklists).
- Why do people use them?: Give a perception of being objective--but they are not…
- Guidelines do not endorse these measures!

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Measuring Childhood Onset

- B. Several symptoms present prior to age 12

- Children under 12: this is not a separate part of assessment
- Adolescents 12+: must assess age of symptom onset
  - Either---use a tool like K-SADS that queries age of symptom onset
  - Give a retrospective childhood questionnaire to parent
    - Limited validity---but only several symptoms need to be present

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Cross-setting Symptoms

- C. Several symptoms present in two or more settings

- Often can be gauged by the A-criterion symptom checklists
  - Tools like K-SADS will specifically ask in what settings the symptoms are present
  - Several is usually interpreted as "three or more" of either IN or H/I

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Impairment Criteria

- D. Clear evidence that symptoms cause significant impairment

- *Best Practices:*
  - Consider multiple informants
  - Use empirically validated impairment rating scales
  - Review objective evidence of impairment (grades, teacher progress reports, observations of bookbag organization, parent-child interaction styles)
  - Are the symptoms preventing the child from adaptive functioning in their environment?

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Impairment Measures (FREE)

- Impairment Rating Scale: https://ccf.fiu.edu/research/_assets/impairment_rating_scales.pdf
- (3+ in any domain is considered impaired)
- Weiss Functional Impairment Rating Scale (WFIRS): https://www.caddra.ca/wp-content/uploads/WFIRS-P.pdf
- For clinical purposes, when defining impairment, clinicians can consider that any domain with at least two domains scored often or much, one item scored very much or a mean score of 1.5 (between sometimes and often across all items on average) is impaired.

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Interpreting Impairment (threshold)

- May want to consider an "and rule" when thinking about impairment
  - Both the teacher and the parent report impairment (prevents halo effects—when one rater has a particularly negative bias about the person) –offsets the more liberal "or" rule used for symptom presence
- Impairment is not "whether they are living up to potential" it is whether the individual is significantly impacted in ability to function adaptively in domains daily life functioning by symptoms
- Most individuals with elevated ADHD symptoms are not sufficiently impaired for the clinical diagnosis of ADHD.
- Could this individual benefit significantly from treatment? Or are they functioning sufficiently with existing coping skills?

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Ruling out Alternative Explanations

- E. Symptoms are not better explained by another mental disorder or substance use
- In childhood/adolescence consider ruling out:
  - Anxiety and depression
  - Effects of past or ongoing traumatic stress/abuse
  - Learning problems
  - Borderline Intellectual Disability
  - Substance use (particularly heavy marijuana use in teens)
  - Traumatic brain injury/concussion
  - Autism spectrum disorder or other neurodevelopmental conditions
- HOWEVER:
  - These conditions are also commonly comorbid with ADHD

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Tools for Differential Diagnosis

- If you have a lot of time:
  - Use a comprehensive diagnostic interview like the K-SADS (and its screener) as best practice
- If you have less time:
  - Consider using a broadband screener such as the SDQ (free) or the ASEBA measures (costly)
  - Follow-up on positive screens with in depth measures
- If conducting a full psychoeducational evaluation for ADHD:
  - Conduct at least an IQ screener (like the WASI) and basic achievement testing (WIAT, Woodcock-Johnson) to rule out learning problems or borderline intellectual disability

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Differential Diagnostic process: Key Questions

- Create a timeline of symptoms? Which came first—ADHD or the comorbidity?
- Could the symptoms solely be explained by the comorbidity in the absence of ADHD?
- Does this comorbidity sometimes mimic ADHD? Would treating the comorbidity eliminate the ADHD-like symptoms?
- Could the ADHD and comorbidity be feeding each other? (i.e., ADHD symptoms causing performance anxiety, which in turn worsens concentration?)
- Is there a family history of ADHD that is consistent with ADHD diagnosis?
- Might that family history also lead to adverse environmental experiences (like an impulsive, abusive parent with poor emotion regulation)

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Other considerations/best practices

- The *DSM-5* criteria define 4 dimensions of ADHD:
- attention-deficit/hyperactivity disorder primarily of the inattentive presentation (ADHD/I) (314.00 [F90.0]);
- attention-deficit/hyperactivity disorder primarily of the hyperactive-impulsive presentation (ADHD/HI) (314.01 [F90.1]);
- attention-deficit/hyperactivity disorder combined presentation (ADHD/C) (314.01 [F90.2]); and
- ADHD other specified and unspecified ADHD (314.01 [F90.8]).

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Other considerations/best practices

- Get to know the child and family through a general clinical interview first:
- https://ccf.fiu.edu/research/_assets/clinical-intake-interview.pdf
- Break up the session over multiple shorter assessments to obtain repeated observations of the youth/family and increase familiarity
- In preschoolers---differentiating with normative behaviors is challenging:
  - Examine and observe the child
  - Require teacher report (parents may not understand behavioral norms as well as teachers)

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Cultural Considerations

- Latino/a youth and Black youth are less likely to be diagnosed with ADHD
- Research suggests:
  - Cultural views on behavioral health may differ and lead to parental under-reporting
  - Teachers may interpret ADHD behaviors as conduct problems or family dysfunction, reducing ADHD assessment referrals
- Important:
  - Assess ADHD through lens of family
  - Build trust and rapport with families from a different cultural background than yours
  - Understand that minority stress and fear of discrimination, as well as stigma in some communities, can also lead to under-reporting
  - Focus on shared goals of helping child grow and find success during assessment

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Documentation

- Document:
  - How the child came to meet each of the A-E criteria for ADHD
  - What evidence you used to make each judgement (what scales, who reporters were)
  - What alternative diagnoses were considered and how they were ruled out
  - When was age of symptom onset?
  - What are the key presenting problems and the key impairment domains?
  - What factors in environment may be mitigating or exacerbating symptoms?
- Key components of assessment recommendations
  - Psychoeducation sources (such as CHADD/National Resource Center on ADHD)
  - Follow-up for medication evaluation (if appropriate)
  - Follow-up for psychosocial treatment
  - Plan for ongoing monitoring of symptoms
  - Suggestions for treatment targets based on key presenting problems

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Questions

- Time for questions about diagnostic challenges----

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Thank you for your time.

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