Facilitator Preparation: Facilitators should thoroughly review this module. They should also prepare or photocopy the table describing diagnostic features of ADHD, and parent and teacher completed Vanderbilt rating scales.

Open the Discussion: Introduce the case title and objectives of the session. Explain that this will be an interactive case discussion prompted by a series of multiple choice questions and not a lecture. Distribute Part I of the case and ask one or more of the participants to read it aloud.

The Distracted Student

Attention Deficit Hyperactivity Disorder

Case Author:

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Expert Content Reviewer:

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Objectives:

- State the differential diagnosis for inattention in a school-aged child.
- Identify the signs and symptoms of Attention Deficit Hyperactivity Disorder (ADHD)
- Discuss the management of ADHD
- Describe how medication can be used to manage ADHD

Part I:

Introduction:

Chief Complaint:
Emily is a 10-year-old fourth grade girl who is brought to your medical clinic by her mother, Mrs. Bishop, who has concerns that Emily is not doing well in fourth grade.

Current History:
Emily has always struggled a little in school but this year she seems to be doing worse. She takes a long time to complete her independent work at school. She has a hard time following her teacher's directions and often seems to daydream in class. When working on assignments she tends to make careless mistakes. She is disorganized and frequently forgets to bring home her homework assignments. Socially, Emily is also having difficulties because she frequently misses other children's social cues.

In the home setting, Emily has a hard time getting her homework completed. When she does remember to bring home the correct homework sheets, she often protests completing her homework. She does not pay attention to the homework instructions and thus often loses some credit, even if she does remember to complete it and turn it in the next day. Emily also has a hard time with completing multiple step directions at home. Her parents find that they need to provide her with simple, one step directions, or else she will get distracted and not complete the necessary steps. Getting dressed in the morning is quite a

challenge as Emily requires multiple prompts to get dressed and downstairs in time for the school bus.

Mrs Bishop questions why Emily is struggling so much. She believes that Emily is a smart and sweet girl who wants to please, and she would like more information about how to help Emily.

Review of systems is negative for recent illnesses, headaches, significant weight changes, heat or cold intolerance, seizures, vision or hearing problems.

Past Medical History:
Emily has received routine well child care with no significant medical illnesses. She has never been hospitalized nor had any surgeries. Emily does not regularly take any medications.

Family and Psychosocial History:
Emily's maternal uncle had attention difficulties all throughout school. No family history of relatives with cardiac defects, arrhythmias, or sudden death under the age of 50 years old.

Emily lives with her mother, who currently stays at home to care for the children, her father, who works in sales, and her 6 year old brother, who is healthy.

Following this reading, ask all participants *"So what do you think about this case? What would you like to focus on during our discussion today?"* List the agenda items on a blackboard or flipchart. Then use the questions below to guide the discussion. Remember that the key to successfully leading a small group is facilitation of discussion rather than lecture. Draw as many participants as possible into the discussion. Allow silences while group members think about questions.

Potential Discussion Questions:

What is included in the differential diagnosis for a child or adolescent with school problems, such as Emily?
The most common conditions to consider are included in the table below.

Developmental • Language or communication disorders • Cognitive Impairment • Learning Disabilities • Giftedness • Attention Deficit Hyperactivity Disorder • Autism spectrum disorders
Mental Health • Depression • Anxiety

• Mood Disorders • Oppositional Defiant Disorder • Psychosocial Stressors (ie, neglect, exposure to violence, divorce)
Medical • Vision and hearing impairments • Seizures • Sleep disorders • Lead poisoning • Thyroid dysfunction • Genetic conditions (such as Fragile X syndrome, Neurofibromatosis)
Medications/Substances • Albuterol and steroids can increase activity levels • Some anti-epileptics can cause behavioral dysregulation or sleepiness, inattention • Substance abuse

The American Academy of Pediatrics 2011 Guideline for ADHD recommends that health care providers initiate an evaluation for ADHD for any child ages 4 through 18 years of age who presents with academic or behavioral problems and symptoms of inattention, hyperactivity, or impulsivity.

Remember that some children may have 2 or more co-morbid conditions, so a diagnosis of one condition does not exclude the potential for another condition as well. Children with ADHD are at higher risk of having other developmental conditions; studies show that up to 60% of children who have ADHD have a coexisting condition such as a learning or language disability, or psychiatric problem (most commonly depression or anxiety and, in boys with hyperactivity and impulsivity, disruptive behavior disorders). A specific learning disability should always be considered in children presenting for an ADHD evaluation, as it can cause secondary inattention. Children will not pay attention to things that they can not understand so they may present as inattentive in school since they do not understand the material being taught.

What questions could you ask to narrow the differential diagnosis?
The clinical history is very important to get a thorough overall understanding of Emily's functioning. Questions to ask Emily and her mother may include the following:

- During the pregnancy with Emily, did her mother use any alcohol, tobacco or other substances? Were there complications with the pregnancy or birth?
- Did Emily meet developmental milestones at the expected times?
- How long has Emily had the difficulties described above (inattention and school difficulties)? Are they new or just becoming more problematic as Emily gets older?
- How has Emily's mood been recently? Has she had frequent sadness, worries? Any changes in or concerns related to sleep, eating, daily living skills?
- How does Emily do socially? Does she have friendships? Get invited to birthday parties? Talk about the children in her class?

- How have Emily's early academic skills progressed? Did she have trouble with rhyming when she was younger? Did she have a hard time learning numbers, letters, and the sounds that letters make?

What aspects of the physical examination should you pay particular attention to?

- Measurement of weight, height and head circumference
- Record vital signs
- Formal assessment of hearing and vision
- Skin should be inspected for café-au-lait spots or other signs of a neurocutaneous disorder
- Cardiac examination should include careful auscultation of the heart and assessment of pulses to be sure that there are no obvious signs of cardiac abnormality (will become important if use of stimulant medications is considered)
- Thorough neurological examination to evaluate for focal neurological findings and poor motor coordination or immaturity.

What other information would you like to collect to further assess Emily?

- The use of **standardized rating scales** is recommended to aid in gathering information about the child's functioning. Rating scales must be interpreted within the clinical context for the child. Rating scales themselves do not make a diagnosis of ADHD. Rather, they can help you to obtain an objective measurement of how the rater (usually parent or teacher) views the child's behaviors relative to other children her age. Examples of commonly used ADHD-specific rating scales include the Vanderbilt Assessment Scales and the Conners' Rating Scales.
- Information about Emily's functioning should be collected in **2 or more settings**, such as home and school. Having teachers complete attention rating scales can help you to get input about her school functioning.
- Emily should have cognitive, academic and social/emotional assessments to evaluate for possible learning disorders and/or mental health conditions. The options for this testing are to advise the family to get this completed privately by a psychologist or to have these assessments completed by the public school district. Having neuropsychological testing completed privately is not covered by all medical insurance companies and in some areas of the country it may be hard to find a psychologist to complete this testing. Under federal law, every child who is struggling at school is entitled to an evaluation (which may include educational and psychological testing) by the public school system at no charge. Most public school districts will do testing to determine eligibility for special education services but may not provide a specific diagnosis. As the health care provider, you can review any completed testing and determine if additional testing is needed to clarify the child's diagnosis and treatment needs.

Distribute Part II of the case and have the participant(s) read it aloud.

<u>Part II:</u>

Next Steps:

Addition History Obtained:
Emily's mother did not use any substances during pregnancy and Emily was born after a full-term, uncomplicated pregnancy. She met all early developmental milestones on time. She has always been an easily distractible child with poor focus but when she was younger her mother attributed these characteristics to her being a young child.

Emily's mood has been mostly happy although she has started to make some self-deprecating comments, such as "I must be stupid because the teacher always has to tell me to do things many times". Emily is socially related and loves being with other children but often seems to miss subtle social cues.. Mrs. Bishop describes her daughter as a bright girl who easily learned her numbers, letters, and letter sounds. She questions why Emily can't seem to perform to her full potential in the classroom.

Emily was evaluated by school psychologist and her mother has provided you with a copy of this report. All examiners were concerned about Emily's ability to pay attention and she made many careless mistakes throughout the testing The psychologist's report states that Emily's IQ scores were in the average range, with low average scores on tests of processing speed. Achievement testing indicates that she has average range reading and math skills.

Physical Exam:
Emily's height and weight are at the 60^{th} percentile for her age. Her heart rate is 90 beats per minute and blood pressure 92/65. Emily's hearing and vision are checked yearly at school and results have always been normal.

Emily presents as a well-appearing, healthy girl. Skin examination reveals no abnormalities. Cardiac exam reveals regular rate and rhythm with no murmurs and normal pulses. Lungs are clear. Neurological examination is unremarkable.

Rating Scales:
Emily's mother and teacher completed behavioral rating scales that you review at the visit.

Pause and begin the next set of discussion questions.

Potential discussion questions:

Now you have collected a great deal of information about Emily's functioning. What are the essential features needed to make a diagnosis of ADHD?
Diagnosis is made clinically based on applying the criteria described in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM, V-TR) which include:

- Persistent and developmentally inappropriate pattern of inattention, hyperactivity and/or impulsivity. A child must have **6 or more symptoms** of inattention, hyperactivity/impulsivity, or both (mixed type) for a period of **at least 6 months** to meet diagnostic criteria. (See Handout 1 listing criteria)

- Presence of several symptoms **prior to age 12 years (according to DSM V-TR criteria)**
- Impairments present in **at least 2 settings** (such as at home and school)
- Significant impairment in social, academic or occupational function
- Symptoms are not due to some other disorder, such as schizophrenia or other psychotic or mental disorder

Handout 1: Diagnostic Features of ADHD (Adapted from DSM V)

INATTENTION	HYPERACTIVITY/IMPULSIVITY
Fails to give close attention to details, makes careless mistakes	Fidgets and/or squirms in seat
Difficulty sustaining attention in work or play	Leaves seat in classroom
Doesn't seem to listen	Runs about or climbs when inappropriate to do so
Cannot follow instructions, fails to complete work	Has difficulty playing quietly
Has difficulty organizing tasks and activities	Always "on the go" or acts as if "driven by a motor"
Avoids tasks that require concentration (schoolwork)	Talks excessively
Loses things needed for tasks and activities (books, assignments)	Blurts out answers before questions have been completed
Easily distracted by extraneous stimuli	Has difficulty awaiting turn
Forgetful in daily activities	Interrupts or intrudes on others

Distribute Handouts 1 and 2 (Parent and Teacher Completed Rating Scales) and allow a few minutes for learners to review its contents. Then use the following discussion points to guide learning:

There are a number of rating scales that can be used to assess attention and behavior in school age children. One option that is available in the public domain is the Vanderbilt rating scale (http://www.nichq.org/resources/adhd_toolkit.html)

Scoring Vanderbilt Rating Scales:

- Rating scales have 2 components: symptom assessments and impairment in performance
- Both the parent and teacher Vanderbilt rating scales screen for the following:
    - Items 1-9 screen for inattention
    - Items 10-18 screen for hyperactivity/impulsivity
    - The remaining items screen for oppositional-defiant/conduct disorder, anxiety and depression
- A positive response is answer choice **2 or 3** (often, very often)

- To meet DSM-V criteria for the diagnosis, a child must have at least 6 positive responses in either the inattentive or hyperactive core symptoms, or 6 positive in each domain
- Additionally, the child must have at least one item of the Performance set in which the child scores a 4 or 5; there must be **functional impairment** present

Follow the instructions at the bottom of the rating scales for scoring.

What are your impressions of Emily's parent and teacher rating scales?

- **Emily's parent rating scale** endorses:
  - 8/9 concerns for inattention; 2/9 concerns for hyperactivity/impulsivity
  - No concerns for oppositional behaviors, conduct disorder, anxiety or depression
  - Problematic performance in several areas
  - Rating scale is consistent with high likelihood of ADHD
- **Emily's teacher rating scale** endorses:
  - 8/9 concerns for inattention; 1/9 concerns for hyperactivity/impulsivity
  - No concerns for oppositional behaviors, conduct disorder, anxiety or depression
  - Problematic performance in several areas
  - Rating scale is consistent with high likelihood of ADHD

What is your diagnosis?

- History, exam, and rating scale results are all consistent with a diagnosis of ADHD, Predominantly Inattentive Type
- At this time, Emily does not meet criteria for a co-morbid disorder. Remember, however, that children with ADHD are at higher risk of other disorders, including learning disorders, oppositional defiant disorder, anxiety, depression, substance abuse, and tics so she should be carefully monitored for development of co-morbid conditions in the future.

Mrs Bishop may ask about the prevalence and risk factors for ADHD. What should you know for this discussion?

- Prevalence in school-aged children is around 8-10%
- ADHD is more common in boys than girls; male to female ratio approximately 4:1
- ADHD is considered a chronic condition
- Risk factors for ADHD may include the following:
  - Genetic component; twin studies demonstrate concordance as high as 92% in monozygotic twins and 33% in dizygotic twins
  - Prenatal exposure to alcohol or tobacco
  - Lead toxicity
  - Prematurity and low birth weight
  - Head trauma in young children

How would you treat Emily's ADHD? Would your treatment change if she were younger or older?

A treatment plan should be tailored to include the individual needs for the child and family. It may require medical, educational, behavioral, and psychological interventions. The following table shows the recommended treatment plan for different ages, as put forth by the American Academy of Pediatrics 2011 clinical practice guideline.

For preschool aged children (4-5 years of age): • First line treatment = behavioral interventions (see AAP Clinical Guidelines (October 2011) for more information about evidence based behavioral treatments for ADHD) • Only prescribe methylphenidate if there is not significant improvement with behavioral interventions and moderate to severe impairment persists
For elementary school aged children (6-11 years of age): • First line treatment = FDA approved medication for ADHD and /or behavioral interventions, preferably both • Stimulant medication should usually be tried first
For adolescents (12-18 years of age): • First line treatment = FDA approved medication for ADHD with the assent of the adolescent • May prescribe behavior therapy in addition to medication

What behavioral interventions can you recommend for Emily?

- Educational accommodations can be implemented at school and may include preferential seating, frequent teacher redirection to task, motor breaks, extra time on tests
- Organizational supports can be given such as assignment book to check off materials needed each night to complete homework, teacher check in to be sure materials get into the backpack to be brought home, visual charts to aid in understanding schedule for the day
- Parent trainings can help parents to more effectively provide rewards when the child demonstrated appropriate behavior, ignore negative behaviors which can help decrease them, engage in consistent limit setting and follow through
- Referral to a behavioral therapist or psychologist may be necessary

When prescribing medication for ADHD, what medication should be used?

- Stimulant medications (methylphenidate or amphetamine derivatives) are generally first line as their effect size is approximately 1.0 (ie, medication helps most people) while effects of non-stimulants are weaker; atomoxetine, extended-release guanfacine and extended-release clonidine all have effect sizes of approximately 0.7 (ie, medication provides symptom relief for about 70% of people)
- Decision of what medication to start often includes considering route of administration (many children cannot swallow pills), desired duration of action, and insurance medication coverage
- Start medication on a day the child will be home with parents in case there is an adverse reaction or significant side effect

- If lowest dose of medication does not reduce ADHD symptoms and also does not cause significant side effects, increase the dose
- If one medication causes significant side effects or if not effective, try another stimulant medication; generally both methylphenidate and amphetamine preparations should be tried before non-stimulant medications are tried
- Extended-release guanfacine and clonidine are the only FDA approved medications to be used as adjunctive therapy with stimulant medications
- Individual children respond differently to different ADHD medications; if a sibling or parent responded well to one particular medication you may want to try that one first

What are the side effects of stimulant medications?

- Most common side effects include:
  - Appetite loss
  - Abdominal pain
  - Headaches
  - Sleep disturbances
- Concerns have been raised about sudden cardiac death among children taking stimulants, however evidence is conflicting as to whether stimulant medications increase risk of sudden death; screen for personal and family cardiac conditions and if none exist child is likely not at increased risk for sudden death

As part of history ask "Does the child or any family member have any of the following": (If any of the following positive, seek cardiology clearance before starting stimulant medications)
✓ Congenital heart disease? ✓ Arrhythmia including Wolf-Parkinson White and Long QT? ✓ Marfan's syndrome? ✓ Hypertrophic cardiomyopathy ✓ Cardiac deaths before age 50 in any family member?

- Tics are no longer thought to be a side effect of stimulant medications; tics are more common in children with ADHD and are likely to wax and wane over time regardless of stimulant medication
- Hallucinations and other psychotic conditions can occur, although these are rare
- Preschool ages children are more likely to have side effects

Distribute Part III: Ask someone to read follow-up aloud.

Part III

Epilogue:

You educate Emily and her mother about ADHD and inform them that you will continue working with them to help control the symptoms of ADHD. Emily's teachers make some accommodations for Emily in the classroom to minimize distractions and frequently check in with her. Emily's mother is interested in learning as much as she can about

ADHD and is working with a behavioral therapist in the community to learn more about how to help Emily with her inattention by providing more support in the home setting.

Emily begins taking long acting methylphenidate 10 mg by mouth each morning. She takes this medication for 2 weeks and then her mother calls you to report that there is no improvement in her ADHD symptoms but she is also not having any side effects. Parent and teacher rating scales confirm her reports; on Vanderbilt rating scales Emily's mother continues to report 8/9 concerns for inattention and 2/9 concerns for hyperactivity/impulsivity and Emily's teacher continues to report 8/9 concerns for inattention and 1/9 concerns for hyperactivity/impulsivity.

You increase the dose to long acting methylphenidate 20 mg by mouth each morning. After 2 weeks you see Emily in clinic for follow up and both Emily and her mother are happy to report that the medication is really helping. Emily is more focused and attentive. She is better able to follow instructions. Review of rating scales completed by Emily's mother and teacher also show fewer ADHD symptoms. Emily's appetite is decreased slightly during the day but returns in the evening; in fact she often has a large bedtime snack. You pay particular attention to Emily's weight and height, which are unchanged in the past month, and her blood pressure and heart rate, which are both within normal limits. She does not report any other side effects.

You decide to continue Emily on long acting methylphenidate 20 mg daily for now. You will have her follow up in clinic in 3 months to monitor her functioning and screen for side effects or other concerns.

Refer back to the group's learning agenda and summarize the key teaching points that were made. This will give the group a sense of accomplishment, and emphasize the important messages. Suggest further sources of reading or other information if there are agenda items that were not covered in the discussion.

Clinical Pearls:

- Health care providers should initiate an evaluation for ADHD for any child ages 4 through 18 years of age who presents with academic or behavioral problems and symptoms of inattention, hyperactivity, or impulsivity.
- At least 6/9 symptoms of inattention and/or hyperactivity must be present in 2 or more settings and cause impairment in functioning to meet criteria for ADHD.
- Always look for co-morbid conditions in a child with ADHD and monitor over time.
- First line treatment for ADHD varies by age; preschoolers should first have behavioral interventions while school aged children and adolescents should be given medication as first line treatment.
- Stimulant medications will often by very effective in managing ADHD but several different doses or types of medication may need to be tried before the one if found that controls ADHD symptoms without significant side effects.
- ADHD is a chronic condition. Families and children should be informed of this from the beginning so that they are aware that treatment for ADHD will require

ongoing interventions and medications to help the child reach his/her full potential.

Knowledge Questions:

Distribute knowledge questions to group

1. Which of the following statements regarding a school aged child presenting with school related problems are true?
A. The differential diagnosis should include developmental, mental health, medical and medication related conditions.
B. If a child is diagnosed with a learning disorder, he or she can NOT also meet criteria for a diagnosis of ADHD.
C. Most often, children with school related problems should try a different classroom first to see if that helps improve their performance.
D. You should not take parents' concerns about school functioning serious because they may not understand how the child is really doing in class.

2. After a thorough history and exam in a school aged child presenting with attention problems, your NEXT STEP should include:
A. Call the principal to find out the qualification of the classroom teacher
B. Recommend family therapy to improve behavior
C. Obtain behavioral rating scales from parents and teachers
D. Perform IQ testing

3. In which type of patient should your first line of therapy be behavioral interventions alone?
A. 8 year old girl with predominantly inattentive ADHD
B. 5 year old boy with ADHD
C. 10 year old boy with co-morbid ADHD and Oppositional Defiant Disorder
D. 15 year old girl with ADHD

4. Which of the following statements about stimulant medications is correct?
A. common side effects include decreased appetite and sleep difficulties
B. stimulants can reduce core symptoms of ADHD
C. stimulants are recommended as first line therapy for school aged children and adolescents with ADHD
D. all of the above

Answers to Knowledge Questions:

1. Which of the following statements regarding a school aged child presenting with school related problems are true?
Preferred response: A "The differential diagnosis should include developmental, mental health, medical and medication related conditions"
There is a broad differential diagnosis for a school aged child presenting with school problems and it should include developmental, mental health, medical and medication related conditions. The majority of children who meet criteria for ADHD also have

another co-morbid condition such as a learning disorder so one diagnosis does not preclude another. In general the child should be assessed first and a placement into another classroom is not made routinely. Parents' concerns should always be taken seriously.

2. After a thorough history and exam in a school aged child presenting with attention problems, your NEXT STEP should include?
Preferred response: C "Obtain behavioral rating scales from parents and teachers"
The use of standardized behavioral rating scales obtained from both parent and teacher is recommended as part of the usual work-up for a school aged child who presents with attention problems. Other recommendations for testing or behavioral interventions are made after these rating scales are obtained if further diagnostic clarification and/or intervention are needed.

3. In which type of patient should first line therapy be implementation of behavioral interventions alone?
Preferred response: B "5 year old boy with ADHD"
The American Academy of Pediatrics 2011 clinical practice guideline for ADHD states that for children ages 4-5 years old first line therapy for ADHD should be behavioral interventions alone and stimulant medications should be included in first line therapy for school aged children and teenagers. Children with co-morbid ADHD and Oppositional Defiant Disorder should be treated medically for ADHD since decreasing core ADHD symptoms can often improve their behavioral functioning.

4. Which of the following statements about stimulant medications is correct?
Preferred response: D "all of the above"
Stimulant medications are recommended as first line therapy for school aged children and adolescents with ADHD because they can reduce the core symptoms of ADHD. Common side effects include decreased appetite and sleep difficulties. The usual course of action is to start with the lowest dose of a given stimulant medication and increase the dose as needed, carefully monitoring for side effects and effectiveness of reducing ADHD symptoms.

References:

1. Subcommittee on Attention-Deficit/Hyperactivity Disorder, Steering Committee on Quality Improvement and Management. ADHD: Clinical practice guideline for the diagnosis, evaluation, treatment of Attention-Deficit/Hyperactivity Disorder in children and adolescents. *Pediatrics* 2011;128:1007.
2. Attention-deficit/Hyperactivity Disorder. In: Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, American Psychiatric Association, Washington, DC, 2013. p.59-60.
3. Barbaresi W, Katusic S, Colligan R, et al. How common is attention-deficit/hyperactivity disorder? Towards resolution of the controversy: results from a population-based study. Acta Paediatr Suppl 2004; 93:55.
4. Millichap GJ. Etiologic classification of Attention-Deficit/Hyperactivity Disorder. *Pediatrics* 2008;121;e358.

5. Wilms Floet AM, Scheiner C, Grossman L. Attention-Deficit/Hyperactivity Disorder. *Pediatrics in Review* 2010;31:56.
6. Lindstrom K, Lindblad F, Hjern A. Preterm Birth and Attention-Deficit/Hyperactivity Disorder in Schoolchildren. *Pediatrics* 2011;127:858.
7. American Academy of Pediatrics. Caring for Children with ADHD: A Resource Toolkit for Clinicians, 2nd Edition.

Educational Resources for Families and Clinicians:

Books

1. *ADHD: A Complete and Authoritative Guide (American Academy of Pediatrics)* by Michael Reiff
2. *Learning to Slow Down and Pay Attention: A Book for Kids About ADHD* by Kathleen Nadeau and Ellen Dixon (2004)
3. *Putting on the Brakes: Young People's Guide to Understanding Attention Deficit Hyperactivity Disorder* by Patricia Quinn and Judith Stern (2001)
4. Understanding Girls with ADHD, by Patricia Quinn, Kathleen Nadeau (2002)

Websites

1. Children and Adults with Attention Deficit/Hyperactivity Disorder National Organization website: http://www.chadd.org/
2. The American Academy of Pediatrics Healthy Children website has information about ADHD: http://www.healthychildren.org/English/health-issues/conditions/adhd/Pages/ADHD-Basics.aspx

Materials for Learners:

Packet should include the following:

- Handout #1: Diagnostic Features of ADHD (Adapted from DSM V)
- Handout #2: Parent and Teacher Completed Vanderbilt Rating Scales
- Clinical pearls
- Knowledge questions and answers
- References

The Distracted Student

Attention Deficit Hyperactivity Disorder

Part I

Introduction:

Chief Complaint:
Emily is a 10-year-old fourth grade girl who is brought to your medical clinic by her mother, Mrs. Bishop, who has concerns that Emily is not doing well in fourth grade.

Current History:
Emily has always struggled a little in school but this year she seems to be doing worse. She takes a long time to complete her independent work at school. She has a hard time following her teacher's directions and often seems to daydream in class. When working on assignments she tends to make careless mistakes. She is disorganized and frequently forgets to bring home her homework assignments. Socially, Emily is also having difficulties because she frequently misses other children's social cues.

In the home setting, Emily has a hard time getting her homework completed. When she does remember to bring home the correct homework sheets, she often protests completing her homework. She does not pay attention to the homework instructions and thus often loses some credit, even if she does remember to complete it and turn it in the next day. Emily also has a hard time with completing multiple step directions at home. Her parents find that they need to provide her with simple, one step directions, or else she will get distracted and not complete the necessary steps. Getting dressed in the morning is quite a challenge as Emily requires multiple prompts to get dressed and downstairs in time for the school bus.

Mrs Bishop questions why Emily is struggling so much. She believes that Emily is a smart and sweet girl who wants to please, and she would like more information about how to help Emily.

Review of systems is negative for recent illnesses, headaches, significant weight changes, heat or cold intolerance, seizures, vision or hearing problems.

Past Medical History:
Emily has received routine well child care with no significant medical illnesses. She has never been hospitalized nor had any surgeries. Emily does not regularly take any medications.

Family and Psychosocial History:
Emily's maternal uncle had attention difficulties all throughout school. No family history of relatives with cardiac defects, arrhythmias, or sudden death under the age of 50 years old.

Emily lives with her mother, who currently stays at home to care for the children, her father, who works in sales, and her 6 year old brother, who is healthy.

The Distracted Student

Attention Deficit Hyperactivity Disorder

Part II

Next Steps:

Addition History Obtained:

Emily's mother did not use any substances during pregnancy and Emily was born after a full-term, uncomplicated pregnancy. She met all early developmental milestones on time. She has always been an easily distractible child with poor focus but when she was younger her mother attributed these characteristics to her being a young child.

Emily's mood has been mostly happy although she has started to make some self-deprecating comments, such as "I must be stupid because the teacher always has to tell me to do things many times". Emily is socially related and loves being with other children but often seems to miss subtle social cues.. Mrs. Bishop describes her daughter as a bright girl who easily learned her numbers, letters, and letter sounds. She questions why Emily can't seem to perform to her full potential in the classroom.

Emily was evaluated by school psychologist and her mother has provided you with a copy of this report. All examiners were concerned about Emily's ability to pay attention and she made many careless mistakes throughout the testing The psychologist's report states that Emily's IQ scores were in the average range, with low average scores on tests of processing speed. Achievement testing indicates that she has average range reading and math skills.

Physical Exam:

Emily's height and weight are at the 60^{th} percentile for her age. Her heart rate is 90 beats per minute and blood pressure 92/65. Emily's hearing and vision are checked yearly at school and results have always been normal.

Emily presents as a well-appearing, healthy girl. Skin examination reveals no abnormalities. Cardiac exam reveals regular rate and rhythm with no murmurs and normal pulses. Lungs are clear. Neurological examination is unremarkable.

Rating Scales:

Emily's mother and teacher completed behavioral rating scales that you review at the visit.

The Distracted Student

Attention Deficit Hyperactivity Disorder

Part III

Epilogue:

You educate Emily and her mother about ADHD and inform them that you will continue working with them to help control the symptoms of ADHD. Emily's teachers make some accommodations for Emily in the classroom to minimize distractions and frequently check in with her. Emily's mother is interested in learning as much as she can about ADHD and is working with a behavioral therapist in the community to learn more about how to help Emily with her inattention by providing more support in the home setting.

Emily begins taking long acting methylphenidate 10 mg by mouth each morning. She takes this medication for 2 weeks and then her mother calls you to report that there is no improvement in her ADHD symptoms but she is also not having any side effects. Parent and teacher rating scales confirm her reports; on Vanderbilt rating scales Emily's mother continues to report 8/9 concerns for inattention and 2/9 concerns for hyperactivity/impulsivity and Emily's teacher continues to report 8/9 concerns for inattention and 1/9 concerns for hyperactivity/impulsivity.

You increase the dose to long acting methylphenidate 20 mg by mouth each morning. After 2 weeks you see Emily in clinic for follow up and both Emily and her mother are happy to report that the medication is really helping. Emily is more focused and attentive. She is better able to follow instructions. Review of rating scales completed by Emily's mother and teacher also show fewer ADHD symptoms. Emily's appetite is decreased slightly during the day but returns in the evening; in fact she often has a large bedtime snack. You pay particular attention to Emily's weight and height, which are unchanged in the past month, and her blood pressure and heart rate, which are both within normal limits. She does not report any other side effects.

You decide to continue Emily on long acting methylphenidate 20 mg daily for now. You will have her follow up in clinic in 3 months to monitor her functioning and screen for side effects or other concerns.

The Distracted Student

Attention Deficit Hyperactivity Disorder

Handout 1: Diagnostic Features of ADHD (Adapted from DSM V)

INATTENTION	HYPERACTIVITY/IMPULSIVITY
Fails to give close attention to details, makes careless mistakes	Fidgets and/or squirms in seat
Difficulty sustaining attention in work or play	Leaves seat in classroom
Doesn't seem to listen	Runs about or climbs when inappropriate to do so
Cannot follow instructions, fails to complete work	Has difficulty playing quietly
Has difficulty organizing tasks and activities	Always "on the go" or acts as if "driven by a motor"
Avoids tasks that require concentration (schoolwork)	Talks excessively
Loses things needed for tasks and activities (books, assignments)	Blurts out answers before questions have been completed
Easily distracted by extraneous stimuli	Has difficulty awaiting turn
Forgetful in daily activities	Interrupts or intrudes on others

NICHQ Vanderbilt Assessment Scale—PARENT Informant

Today's Date: 3/20/2012 Child's Name: Emily Bishop Date of Birth: 01/05/2002

Parent's Name: Susan Bishop Parent's Phone Number: _____

Directions: Each rating should be considered in the context of what is appropriate for the age of your child. When completing this form, please think about your child's behaviors in the past 6 months.

Is this evaluation based on a time when the child ☐ **was on medication** ☒ **was not on medication** ☐ **not sure?**

Symptoms	Never	Occasionally	Often	Very Often
1. Does not pay attention to details or makes careless mistakes with, for example, homework	0	1	2	(3)
2. Has difficulty keeping attention to what needs to be done	0	1	(2)	3
3. Does not seem to listen when spoken to directly	0	1	2	(3)
4. Does not follow through when given directions and fails to finish activities (not due to refusal or failure to understand)	0	1	(2)	3
5. Has difficulty organizing tasks and activities	0	1	2	(3)
6. Avoids, dislikes, or does not want to start tasks that require ongoing mental effort	0	(1)	2	3
7. Loses things necessary for tasks or activities (toys, assignments, pencils, or books)	0	1	2	(3)
8. Is easily distracted by noises or other stimuli	0	1	2	(3)
9. Is forgetful in daily activities	0	1	(2)	3
10. Fidgets with hands or feet or squirms in seat	0	1	(2)	3
11. Leaves seat when remaining seated is expected	(0)	1	2	3
12. Runs about or climbs too much when remaining seated is expected	(0)	1	2	3
13. Has difficulty playing or beginning quiet play activities	0	(1)	2	3
14. Is "on the go" or often acts as if "driven by a motor"	(0)	1	2	3
15. Talks too much	0	(1)	2	3
16. Blurts out answers before questions have been completed	(0)	1	2	3
17. Has difficulty waiting his or her turn	(0)	1	2	3
18. Interrupts or intrudes in on others' conversations and/or activities	0	1	(2)	3
19. Argues with adults	(0)	1	2	3
20. Loses temper	(0)	1	2	3
21. Actively defies or refuses to go along with adults' requests or rules	(0)	1	2	3
22. Deliberately annoys people	(0)	1	2	3
23. Blames others for his or her mistakes or misbehaviors	(0)	1	2	3
24. Is touchy or easily annoyed by others	(0)	1	2	3
25. Is angry or resentful	(0)	1	2	3
26. Is spiteful and wants to get even	(0)	1	2	3
27. Bullies, threatens, or intimidates others	(0)	1	2	3
28. Starts physical fights	(0)	1	2	3
29. Lies to get out of trouble or to avoid obligations (ie, "cons" others)	(0)	1	2	3
30. Is truant from school (skips school) without permission	(0)	1	2	3
31. Is physically cruel to people	(0)	1	2	3
32. Has stolen things that have value	(0)	1	2	3

Adapted from the Vanderbilt Rating Scales developed by Mark L. Wolraich, MD.

Revised - 1102

NICHQ Vanderbilt Assessment Scale—PARENT Informant

Today's Date: 3/20/2012 Child's Name: Emily Bishop Date of Birth: 01/05/2002

Parent's Name: Susan Bishop Parent's Phone Number: _____

Symptoms (continued)	Never	Occasionally	Often	Very Often
33. Deliberately destroys others' property	(0)	1	2	3
34. Has used a weapon that can cause serious harm (bat, knife, brick, gun)	(0)	1	2	3
35. Is physically cruel to animals	(0)	1	2	3
36. Has deliberately set fires to cause damage	(0)	1	2	3
37. Has broken into someone else's home, business, or car	(0)	1	2	3
38. Has stayed out at night without permission	(0)	1	2	3
39. Has run away from home overnight	(0)	1	2	3
40. Has forced someone into sexual activity	(0)	1	2	3
41. Is fearful, anxious, or worried	(0)	1	2	3
42. Is afraid to try new things for fear of making mistakes	(0)	1	2	3
43. Feels worthless or inferior	(0)	1	2	3
44. Blames self for problems, feels guilty	(0)	1	2	3
45. Feels lonely, unwanted, or unloved; complains that "no one loves him or her"	(0)	1	2	3
46. Is sad, unhappy, or depressed	(0)	1	2	3
47. Is self-conscious or easily embarrassed	(0)	1	2	3

Performance	Excellent	Above Average	Average	Somewhat of a Problem	Problematic
48. Overall school performance	1	2	3	4	(5)
49. Reading	1	2	3	(4)	5
50. Writing	1	2	3	(4)	5
51. Mathematics	1	2	3	(4)	5
52. Relationship with parents	1	2	3	(4)	5
53. Relationship with siblings	1	2	3	4	(5)
54. Relationship with peers	1	2	3	(4)	5
55. Participation in organized activities (eg, teams)	1	2	3	(4)	5

Comments:

For Office Use Only

Total number of questions scored 2 or 3 in questions 1–9: _____

Total number of questions scored 2 or 3 in questions 10–18: _____

Total Symptom Score for questions 1–18: _____

Total number of questions scored 2 or 3 in questions 19–26: _____

Total number of questions scored 2 or 3 in questions 27–40: _____

Total number of questions scored 2 or 3 in questions 41–47: _____

Total number of questions scored 4 or 5 in questions 48–55: _____

Average Performance Score: _____

D4 **NICHQ Vanderbilt Assessment Scale—TEACHER Informant**

Teacher's Name: Linda Potts Class Time: all day Class Name/Period: _____

Today's Date: 3/29/2013 Child's Name: Emily Bishop Grade Level: 4th grade

Directions: **Each rating should be considered in the context of what is appropriate for the age of the child you are rating and should reflect that child's behavior since the beginning of the school year. Please indicate the number of weeks or months you have been able to evaluate the behaviors:** 7 months

Is this evaluation based on a time when the child ☐ **was on medication** ☐ **was not on medication** ☒ **not sure?**

Symptoms	Never	Occasionally	Often	Very Often
1. Fails to give attention to details or makes careless mistakes in schoolwork	0	1	2	(3)
2. Has difficulty sustaining attention to tasks or activities	0	1	2	(3)
3. Does not seem to listen when spoken to directly	0	1	(2)	3
4. Does not follow through on instructions and fails to finish schoolwork (not due to oppositional behavior or failure to understand)	0	1	(2)	3
5. Has difficulty organizing tasks and activities	0	1	2	(3)
6. Avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort	0	1	(2)	3
7. Loses things necessary for tasks or activities (school assignments, pencils, or books)	0	(1)	2	3
8. Is easily distracted by extraneous stimuli	0	1	2	(3)
9. Is forgetful in daily activities	0	1	(2)	3
10. Fidgets with hands or feet or squirms in seat	(0)	1	2	3
11. Leaves seat in classroom or in other situations in which remaining seated is expected	(0)	1	2	3
12. Runs about or climbs excessively in situations in which remaining seated is expected	(0)	1	2	3
13. Has difficulty playing or engaging in leisure activities quietly	(0)	1	2	3
14. Is "on the go" or often acts as if "driven by a motor"	(0)	1	2	3
15. Talks excessively	(0)	1	2	3
16. Blurts out answers before questions have been completed	(0)	1	2	3
17. Has difficulty waiting in line	(0)	1	2	3
18. Interrupts or intrudes on others (eg, butts into conversations/games)	0	1	(2)	3
19. Loses temper	(0)	1	2	3
20. Actively defies or refuses to comply with adult's requests or rules	(0)	1	2	3
21. Is angry or resentful	(0)	1	2	3
22. Is spiteful and vindictive	(0)	1	2	3
23. Bullies, threatens, or intimidates others	(0)	1	2	3
24. Initiates physical fights	(0)	1	2	3
25. Lies to obtain goods for favors or to avoid obligations (eg, "cons" others)	(0)	1	2	3
26. Is physically cruel to people	(0)	1	2	3
27. Has stolen items of nontrivial value	(0)	1	2	3
28. Deliberately destroys others' property	(0)	1	2	3
29. Is fearful, anxious, or worried	(0)	1	2	3
30. Is self-conscious or easily embarrassed	(0)	1	2	3
31. Is afraid to try new things for fear of making mistakes	(0)	1	2	3

Adapted from the Vanderbilt Rating Scales developed by Mark L. Wolraich, MD.

Revised - 0303

HE0351

D4 NICHQ Vanderbilt Assessment Scale—TEACHER Informant, continued

Teacher's Name: Linda Potts Class Time: all day Class Name/Period: _____

Today's Date: 3/29/2012 Child's Name: Emily Bishop Grade Level: 4th grade

Symptoms (continued)	Never	Occasionally	Often	Very Often
32. Feels worthless or inferior	(0)	1	2	3
33. Blames self for problems; feels guilty	(0)	1	2	3
34. Feels lonely, unwanted, or unloved; complains that "no one loves him or her"	(0)	1	2	3
35. Is sad, unhappy, or depressed	(0)	1	2	3

Performance *Academic Performance*	Excellent	Above Average	Average	Somewhat of a Problem	Problematic
36. Reading	1	2	3	(4)	5
37. Mathematics	1	2	3	(4)	5
38. Written expression	1	2	3	(4)	5

Classroom Behavioral Performance	Excellent	Above Average	Average	Somewhat of a Problem	Problematic
39. Relationship with peers	1	2	(3)	4	5
40. Following directions	1	2	3	4	(5)
41. Disrupting class	1	2	(3)	4	5
42. Assignment completion	1	2	3	4	(5)
43. Organizational skills	1	2	3	4	(5)

Comments:

Please return this form to: _____

Mailing address: _____

_____

Fax number: _____

For Office Use Only

Total number of questions scored 2 or 3 in questions 1–9: _____

Total number of questions scored 2 or 3 in questions 10–18: _____

Total Symptom Score for questions 1–18: _____

Total number of questions scored 2 or 3 in questions 19–28: _____

Total number of questions scored 2 or 3 in questions 29–35: _____

Total number of questions scored 4 or 5 in questions 36–43: _____

Average Performance Score: _____