Attention-Deficit/Hyperactivity Disorder in School-Aged Children

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Diagnosis

- Symptoms must be present in two or more settings
- There must be clear functional impairment
- Suspect diagnosis of ADHD in children and adolescents who present with:
  - Hyperactivity
  - Impulsivity
  - Inattention
  - Behavior problems
  - Academic under achievement

Assessment

- Physical examination including auditory and visual screening
- Neurological evaluation

- Diagnosis of the specific symptoms necessary to make an ADHD diagnosis from information directly obtained from parents and teacher(s)
- Age of child/adolescent at onset of symptoms
- Specific settings in which symptoms are identified
- Degree and specific functional impairments
- Utilize questionnaires and rating scales that have been validated for ADHD; report cards (evidence-based data does not support the use of any other diagnostic or psychological testing for diagnosing ADHD)
- Assess for potential comorbid conditions which is critical for appropriate treatment planning and maximizing a positive outcome

Treatment

- Develop a treatment plan that recognizes ADHD is a chronic condition
- Educate parents and child/adolescent on:
  - ADHD and its course with and potentially without treatment
  - Treatment options
  - Impact on learning, behavior, self-esteem, social skills, and family functioning
  - Available resources both locally and nationally (ex: CH.A.D.D.)
- Management of ADHD in children requires consistent handling and good communication across multiple settings (With parents, child/adolescent and teacher's) develop specific treatment targets and outcomes to be achieved (three to six targets) that are realistic, attainable, and measurable
- Utilize stimulant medication (first-line pharmacological option) and/or behavior therapy to treat target symptoms:
  - If one stimulant does not work at a maximum therapeutic dose, try an alternative stimulant;
  - If the second stimulant does not work at a maximum therapeutic dose, a third type or formulation may be tried; or
  - Utilize a second-line option

Positive Response of Target Symptoms

- Continue present treatment plan and reassess at appropriate intervals

Minimal or No Response of Target Symptoms

- Make sure target symptoms are realistic and attainable
- Reassess diagnosis and potential comorbidities
- Assess adherence to treatment plan and resolve any impediments to treatment (lack of adherence to treatment plan is a common cause for non-response)
- Utilize all appropriate treatments
- Consultation or referral to a child/adolescent psychiatrist, psychologist or appropriate mental health professional

Outcome

- Determining outcome of treatment requires information from: parents; teacher(s); other adults in the child/adolescent's life; and the child/adolescent
- Monitoring should include:
  - Date of refills, medication type, dosage, frequency of use, quantity, and response to treatment (medication and behavioral interventions)
  - Method of communication with parents and child/adolescent and periodic contact with teacher(s)
  - Frequency of monitoring will depend on the severity of the symptoms, complications, adherence to treatment, and support needed by the family
- Once stability is achieved (i.e., no or minimal symptoms with no or minimal functional impairment) follow-up visits can be every three months for the first six months, and then every three to six months thereafter.

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Diagnostic Criteria for Attention-Deficit/Hyperactivity Disorder

A. Either 1 or 2

1. Six (or more) of the following symptoms of inattention have persisted for at least six months to a degree that is maladaptive and inconsistent with developmental level:

Inattention

a. Often fails to give close attention to details or makes careless mistakes in schoolwork, work or other activities
b. Often has difficulty sustaining attention in tasks or play activities
c. Often does not seem to listen when spoken to directly
d. Often does not follow through on instructions and fails to finish schoolwork, chores or duties in the workplace (not due to oppositional behavior or failure to understand instructions)
e. Often has difficulty organizing tasks and activities
f. Often avoids, dislikes or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)
g. Often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, books or tools)
h. Is often easily distracted by extraneous stimuli
i. Is often forgetful in daily activities

2. Six (or more) of the following symptoms of hyperactivity-impulsivity have persisted for at least six months to a degree that is maladaptive and inconsistent with developmental level:

Hyperactivity

a. Often fidgets with hands or feet or squirms in seat
b. Often leaves seat in classroom or in other situations in which remaining seated is expected
c. Often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness)
d. Often has difficulty playing or engaging in leisure activities quietly
e. Is often "on the go" or often acts as if “driven by a motor”
f. Often talks excessively

Impulsivity

a. Often blurts out answers before questions have been completed
b. Often has difficulty awaiting their turn
c. Often interrupts or intrudes on others (e.g., butts into conversations or games)

B. Some hyperactive-impulsive or inattentive symptoms that caused impairment were present before age seven.
C. Some impairment from the symptoms is present in two or more settings (e.g., at school [or work] and at home).
D. There must be clear evidence of clinically significant impairment in social, academic or occupational functioning.
E. The symptoms do not occur exclusively during the course of a pervasive developmental disorder, schizophrenia or other psychotic disorder and are not better accounted for by another mental disorder (e.g., mood disorder, anxiety disorder, dissociative disorder or a personality disorder).

Assessment

Physical and neurological exam:
+ Vital signs including height and weight
+ Hearing and vision
+ General appearance
+ Mental status

Mental status - comorbid conditions:
+ Oppositional defiant disorder
+ Conduct disorder
+ Anxiety
+ Depression
+ Learning/language disorders

Substance use history:
+ Type and amount (any amount is relevant)

Problems with the legal system:
+ Arrests
+ Traffic tickets
+ Motor vehicle accidents

Home/family interactions:
+ Disorganization of personal space
+ Anger/rage reactions
+ Homework organization and completion

School performance:
+ Teacher(s) report
+ Report cards
+ Reprimands or notes sent home from school
+ Extracurricular activities and performance

Social skills:
+ Friendships
+ Group cohesion
+ Strengths and interests

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Evidence-Based ADHD Information

- Prevalence of ADHD (in school age population):
  - Community-based population: 10% (5.8% - 13.6% males; 1.9% - 4.5% females)
  - School-based population: 7%
  - Hyperactive type is more common in males; inattentive type is more common in females
- At least 50% of children/adolescents with ADHD exhibit significant residual symptoms in adulthood
- Stimulant medication is the standard of care for pharmacological treatment and evidence demonstrates it is also more efficacious than psychosocial interventions
  - 80% of patients with ADHD will respond to one of the stimulants if they are used in a systematic manner
  - Documented effects of ADHD stimulant responders include: reduced motor activity to the level of their peer group; decreased excessive talking, noise, and disruption in the classroom; improved handwriting; improved fine motor control; reduced anger; reduced bossiness with peers; reduced verbal and physical aggression with peers; reduced impulsive stealing and property destruction; reduced defiance and oppositional behavior with adults; decreased intensity of behavior; improved peer social status; improved ability to play and work independently; improved mother-child and family interactions; improved sustained attention; improved short-term memory; reduced distractibility; reduced impulsivity; increased amount of academic work completed; and increased accuracy of academic work
- Currently, genetic loading appears to be the primary cause of ADHD; however, many environmental correlations have been found in studies that may prove to represent etiologic connection as research progresses

Psychosocial Treatment Options

- Behavioral techniques:
  - Positive reinforcement: providing rewards/privileges contingent on the child/adolescent's performance.
  - Time-out: removing access to positive reinforcement contingent on performance of unwanted/problem behavior.
  - Response cost: withdrawing rewards/privileges contingent on the performance of unwanted/problem behavior.
  - Token economy: combining positive reinforcement and response cost. The child earns rewards/privileges contingent on performing desired behaviors and loses the rewards/privileges based on undesirable behavior.
  - Self-mediated strategies: children/adolescents self-monitor and self- reinforce rewards for meeting determined goals.
  - Modeling: helps children/adolescents develop social skills and use role playing to teach appropriate behavior.
  - Cognitive-behavioral strategies: problem solving and anger management skills are taught so they can be used in particular situations.
  - Peer mediated interventions: peers monitor behavior and distribute tokens when earned. This must be monitored in order to avoid a negative impact on peer relations.
- Social skills treatment
- Educational therapy

ADHD and Comorbidities

+ Conduct disorder	35%
+ Oppositional defiant disorder	26%
+ Anxiety disorders	26%
+ Depressive disorders	18%
+ Substance use disorders	27% - 47% (in untreated ADHD individuals)
+ Learning disabilities	20%
+ Tourette's syndrome (TS)	40% - 60% of TS clinic populations suffer from some form of ADHD; but the opposite is not true for ADHD diagnosed patients

Psychosocial Treatment Options

- **American Academy of Family Physicians (AAFP)**
  http://www.aafp.org
- **American Academy of Pediatrics (AAP)**
  http://www.aap.org
- **American Medical Association (AMA)**
  http://www.ama-assn.org
- **Attention-Deficit Disorder Association (ADDA)**
  http://www.add.org
- **Center for Mental Health Services Knowledge Exchange Network**
  http://www.mentalhealth.org
- **Children and Adults with Attention-Deficit/Hyperactivity Disorder (CH.A.D.D.)**
  http://www.chadd.org
- **Comprehensive Treatment for Attention-Deficit Disorder (CTADD)**
  http://www.ctadd.com
- **eMedicine**
  http://www.emedicine.com
- **National Institute of Mental Health (NIMH)**
  http://www.nimh.nih.gov/publicat/adhdmenu.cfm
- **Vanderbilt Child Development Center**
  http://peds.mc.vanderbilt.edu/cdc/rating~1.html
- **Learning Disabilities Association of America**
  http://www.ldanatl.org
- **US Department of Education**
  http://www.ed.gov

ADHD Questionnaires and Rating Scales

Conners
Parent
Teacher

Barkley's School Situations Questionnaire
Number of Problem Settings Scale
Mean Severity Scale

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Medications Used in the Treatment of ADHD		
Generic/**Brand Name**	**Dosing**	**Duration of Effect**
Short-acting -Methylphenidate **Ritalin‡, Metadate, Methylin, Focalin**	5mg-40mg 0.3-1.0mg/kg; up to 3mg/kg has been used with children BID – TID	3-5 Hours
Intermediate-acting – Methylphenidate **Ritalin SR*‡, Metadate ER*‡, Methylin ER***	20mg-40mg QD or 40mg AM & 20mg afternoon	4-8 Hours
Extended/Prolonged-acting – Methylphenidate **Concerta*, Metadate CD*, Ritalin LA* **** **Focalin XR** – dexmethylphenidate HCl	0.3mg-2mg/kg QD 5 mg - 20 mg QD in children	8-12 Hours 8-12 hours
Short-acting – Dextroamphetamine **Dexedrine‡ Dextrostat**	5mg-40mg BID-TID	4-5 Hours
Intermediate-acting Amphetamine/dextroamphetamine **Adderall‡**	5mg-30mg QD or 5mg-15mg BID	4-6 Hours
Extended/Prolonged-acting – Amphetamine/dextroamphetamine (mixed salts of amphetamine) **Adderall XR***	10mg –30mg QD	8-12 Hours
Non-stimulants: Second-line Treatment		
Pemoline/**Cylert***‡**	37.5mg starting dose; may increase by 18.75mg/week to effect, not to exceed 112.5mg	4 Hours
Atomoxetine (SNRI) **Strattera**	Under 70kg: 1.2mg/kg QD; Start with 0.5mg/kg x 3 days; Max dose 1.4mg/kg; alternative 0.6mg/kg BID Greater than 70kg: 40mg QD X 3 days; Then increase to 80mg QD or 40mg BID	24 Hours
Bupropion (NDRI) **Wellbutrin‡ Wellbutrin SR‡**	50mg-100mg TID 100mg-150mg BID	24 Hours
TCAs Imipramine/**Tofranil‡** Desipramine/**Norpramin‡**	10mg-25mg QD; increase by 2mg-5mg/kg as tolerated Can give BID-TID to improve tolerance Of side effects	24 Hours
Alpha-adrenergic agonist**** Clonidine/**Catapres‡** Guanfacine/**Tenex ‡**	May require more than once a day dosing	May require more than once a day dosing

***** Do not cut, crush, or chew

****** Can be sprinkled

******* Hepatotoxicity including fatal liver failure has occurred; caution is suggested in prescribing

******** Generally used for aggressive behavior, hyperarousal or night time sedation as an adjunctive medication to one of the stimulants. Has been associated with (rare) death when co-administered with methylphenidate.

‡ Indicates that a lower cost generic alternative may be available.

For all medications listed above see PDR for complete prescribing, monitoring, side effect, & drug interaction information. To obtain additional information regarding medications covered by Cigna healthcare benefit plans, please consult https://secure.cigna.com/health/form/drug_list.html.

The ultimate judgment regarding any specific clinical procedure is the responsibility of the treating physician, based on a current knowledge of psychotherapeutic technique and psychopharmacology, dosages, drug interactions, side effects and the presenting circumstances of the patient.
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