UW General Pediatrics Guidelines: Attention Deficit and Hyperactivity Disorder

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References and Resources

- Seattle Children’s Partnership Access Line Guidelines: http://www.seattlechildrens.org/healthcare-professionals/access-services/partnership-access-line
- Center for Disease Control Information: http://www.cdc.gov/ncbddd/adhd
- AAP ADHD toolkit: http://www2.aap.org/pubserv/adhd2/1sted.html
- NICHQ ADHD toolkit: https://www.addrc.org/toolkit-for-clinicians/

Scope of the problem

- According to the Centers for Disease Control and Prevention, recent surveys show that approximately 11% of children age 4-17 have been diagnosed with ADHD.

Objectives

1. Identification of children with core symptoms of ADHD/ADD
2. Diagnosis of ADHD/ADD
3. Treatment of ADHD/ADD

Eligibility

1. Children ages 5-18
2. Preschool Children, 2-4, will be considered as a separate group

Exclusion Criteria

1. Rapid Onset of Symptoms – Consider other conditions such as head trauma, physical or sexual abuse, neurodegenerative disorders, substance use, major psychological stress in the family or school, such as bullying.
2. Substance Abuse Disorder (SUD) - this disorder should be addressed first before fully addressing the patient’s ADHD diagnosis.
   - Helpful article on co-occurring SUD and ADHD is at this link: http://pediatrics.aappublications.org/content/134/1/e293
Comorbid conditions

- Children and adolescents with ADHD/ADD have high rates of comorbid conditions
  - Tic Disorder 40%
  - Anxiety – 33%
  - Mood Disorders, including PTSD: 20 – 30%
  - Language or Learning problems – 25 – 35%
  - Substance Abuse – 20 – 40%
  - Oppositional Defiant Disorder and Conduct Disorder – 10 – 30%
  - Sleep Disorders: 15 – 20%
  - Autism Spectrum: 14 – 24%
- Consider Co-morbidity or Alternate Diagnosis and perform/recommend screening where indicated (e.g. Neuropsychometric testing, sleep study, other mental health screening (PHQ, SCARED, GAD 7)

Common Risk Factors for ADHD to Consider

- Family history
- Perinatal exposure to alcohol, methamphetamine
- Prematurity
- Congenital heart disease, particularly complex congenital heart disease
- Spina bifida

Evaluation

AAP Clinical Practice Guideline: “Primary care physician should initiate an evaluation for children who present with academic or behavioral problems and symptoms of inattention, hyperactivity, or impulsivity”

Diagnosis

1. Make sure the criteria for DSM 5 have been met. These are:
   a. Symptoms with onset before age 12;
   b. Symptoms present for at least 6 months;
   c. Symptoms present in 2 or more settings (school, home, after school care, after school activities);
   d. Clinically significant impairment due to symptoms;
   e. Impairment not explained by another disorder;
   f. 6 symptoms of inattention or hyperactivity/impulsivity or both.
      i. Inattention symptoms include: lack of attention to detail/careless mistakes, difficulty sustaining attention, does not seem to listen when spoken to, poor follow through, difficulty with organization, avoidance of tasks requiring sustained mental effort, loses things, easily distracted, forgetful.
ii. **Hyperactivity/Impulsivity symptoms include:** blurs out answers, runs/climbs excessively (restless in adolescents), difficulty staying in seat, difficulty engaging in quite activities, “on the go”, talks excessively, interrupts, difficulty awaiting turn, fidgets.

2. DSM 5 approved Rating Scales should be used. While we recommend use of the Vanderbilt questionnaires, we acknowledge the Connors questionnaires as an acceptable alternative. See Addendum for Vanderbilt forms

3. Obtain information from reports from parents or guardians (include co-parents if not in same household), teachers, and other school or mental health clinicians involved in the child’s care.

**Consider Other Screening if physical disease suspected**

1. Neuroimaging – Generally not indicated unless focal neurologic exam
2. Sleep study
3. Audiologic evaluation
4. Vision screening
5. Labs (anemia, thyroid, lead)

**Consider Medication Side Effects that may mimic ADHD**

1. Bronchodilators
2. Corticosteroids
3. Antihistamines
4. Antipsychotics

**Treatment**

1. **Prior to treatment with medications, screening for cardiac issues is now recommended**
   - It is important to obtain a careful history of cardiac symptoms, a cardiac family history, particularly of arrhythmias, sudden death, and death at a young age from cardiac conditions; and vital signs, cardiac physical examination and further evaluation (e.g., EKG) on the basis of clinical judgment.
   - See Addendum for AAP Cardiac Guidelines

2. **The recommendations for treatment of children and youth with ADHD vary by age**
   - Evidence based parent and teacher behavior therapy is the recommended first line treatment for ADHD in young children (age 2 – 5), and should be tried before medication is prescribed. If the behavior interventions do not provide significant improvement and there is moderate to severe impairment in the child’s function, medication should be considered. See AAP article [www.pediatrics.org/cgi/doi/10.1542/peds2016-2025](http://www.pediatrics.org/cgi/doi/10.1542/peds2016-2025)
3. **For elementary school-aged children:** the primary clinician should prescribe FDA approved medications for ADHD and/or evidence based parent and/or teacher administered behavior therapy as treatment of ADHD, preferably both. The evidence is particularly strong for stimulant medications and sufficient but less strong for atomoxetine, extended release guanfacine and extended release clonidine (in that order).

4. **For adolescents (12-18 years of age)** the primary care clinician should prescribe FDA approved medications for ADHD with the assent of the adolescent and may prescribe behavior therapy as treatment for ADHD, preferably both.

5. **Stimulant use:** The provider can either start with a methylphenidate or an amphetamine product. Amphetamines are FDA approved for over 3 years of age, Methylphenidate for greater than 6 years of age. Both have similar efficacy but side effects may be more pronounced with the amphetamine products. See Addendum for a chart of immediate and sustained release stimulants and their names

   - Primary care clinicians should titrate dose of medication for ADHD to achieve maximum benefit with minimum adverse effects.
   - If the maximum dose of a stimulant preparation is reached, and less than satisfactory results have been achieved or side effects are intolerable, a medication from the other stimulant group should be recommended with a similar titration plan.
   - **Side effects of the stimulants** include: appetite suppression, insomnia, headaches, stomachaches, emotional lability, irritability and aggression, increase in tics. Rare side effect is priapism.
     - Stimulants can cause a slowing in growth velocity for weight and height, thus monitoring is crucial over time.
     - For some good ways to minimize side effects see the addendum from the Seattle Childrens PALS guidelines
   - Families concerned about the use of stimulants or with concerns about abuse or diversion may choose to start with atomoxetine (Strattera) or guanfacine (Tenex).

6. **Noradrenergic reuptake inhibitor (Strattera/Atomoxetine)**
   - Families should be counseled that Atomoxetine might need 2 – 6 weeks to see maximum response. Atomoxetine can help some patients with anxiety but also comes with a “black box” warning like the SSRIS for increased risk of suicidality.
   - Dosing for Atomoxetine is 0.5 mg per kg for 3 to 14 days (until initial side effects of adjustment go away) then increase to 1.2 mg/kg daily. Maximum dose is 100 mg or 1.4 mg /kg, whichever is less. This medication is approved for 6 years and older.
   - **Side effects for Atomoxetine** include gastric distress, sedation, and insomnia in some patients, particularly older children. This medication is not recommended for patients with structural cardiac abnormalities.

7. **Alpha agonists**
   - Guanfacine (Tenex) or extended release Guanfacine (Intuniv) or Clonidine may be used as single agent treatment for ADHD or as an adjunctive therapy in children who partially respond to stimulant medication, particularly those who continue to have impulse control issues.
   - These alpha agonists may be more effective for hyperactivity and impulsivity than inattention. Side effects include sedation (particularly clonidine), dizziness,
hypotension and bradycardia. There is a small risk of rebound hypertension so weaning is important in chronic use.

- See addendum for chart or dosing of Clonidine and Guanfacine

8. **Bupropion (Welbutrin)**
   - This medication works on the dopaminergic and noradrenergic systems. It can be considered if primary treatment fails or if there are compelling co-morbid factors such as mood disorders, substance abuse, or smoking. Note that this medication is not FDA approved for pediatric use.
   - Side effects of this medication include insomnia, appetite decrease, less common tics and seizures. Starting dose is 3 mg/kg/day or for older kids 150 mg per day. Titration can be up to 300 mg per day or 6 mg/kg/day.

9. **Strong consideration of evidence based behavior support for children and teens should be part of any ADHD management plan.**
   - Manual and research based therapies for ADHD related problems lasting 10-20 sessions that can be performed by a qualified therapist. These treatments, though helpful with ADHD, are usually less effective than medications. When combined with medications, these therapies may improve some difficulties more than treating with medications alone. Principal elements of these treatments are
     - Reviewing information about the nature of ADHD
     - Learning to attend carefully to both misbehavior and when the child complies
     - Establishing a token economy for rewards
     - Using time out effectively
     - Managing non-compliant behavior in public settings
     - Using a daily school report care
     - Anticipating triggers for future misconduct
   - Examples of evidence based behavior support include:
     - Parent Education and Child Behavior Therapy (Incredible Years Curriculum, TOPS program for teens);
     - Behavior Management Training;
     - Social Skills Training;
     - School Supports – consider IEP, 504 (the NICHQ toolkit has sample forms for parents to use)

10. **Other Treatment Considerations - Alternative/Complementary Medicine or Therapies**
    - Treatments with Evidence of Benefit:
      - **Omega 3 Fatty Acids:** Meta-analysis in 2011 showed small but significant effect at EPA doses of 450 – 600 mg. This can be used to augment traditional pharmacologic interventions or for families that decline other options. Vayarin, a prescription strength Omega 3, has not been extensively studied to prove if it is different in outcome than other Omega 3 products.
      - **Physical Activity:** Recent review of 16 studies showed enhanced executive function and attention improvement with physical exercise for children with ADHD. Mechanism of action is felt to be through enhancement of neural growth and alteration of gene expression. The effect varied from small to large and more studies are needed.
Treatments with Limited Evidence of Benefit/Requires Further Study

- **Neurofeedback**: This is based on differences in theta and beta brain wave activity in ADHD children compared to non-affected peers. Neurofeedback computer program provides immediate feedback based on EEG activity and children learn to induce desired waves. A review of 15 studies (only 4 randomized) shows benefit to impulsivity and attention. More studies are needed.

- **Dietary Intervention**: 2013 Meta-analysis showed some mild benefit from elimination of food color from diet but the effects may be limited to those with suspected food sensitivities. Other elimination diets did not demonstrate significant benefit. A recent FDA report suggested that “Exposure to food and food components, including AFC and preservatives, as well as sugar, may be associated with behavioral changes, not necessarily related to hyperactivity, in certain susceptible children with ADHD and other problem behaviors, and possibly in susceptible children from the general population. Findings suggest that this food related triggering of behavioral changes is not due to an inherent neurotoxic property of the food or food components, including AFC and preservatives, but appears to result from a unique intolerance exhibited by certain predisposed children to a variety of food items and color additives. The etiology of this type of unique intolerance is unclear but may involve genetic, endocrine, or immunologic pathways.”

- **Mindfulness training**: A few small studies suggest that formal mindfulness training programs may help children with ADHD. Further study is indicated.

Treatments With No Evidence of Benefit

- **Amen Scans and Supplements**: Despite his extensive presence in the media, Daniel Amen’s work with Spect scans to diagnosis and expensive supplements to treat ADHD/ADD has not been studied or validated in peer reviewed journals. His for-profit business and motives are held in high suspicion by prominent neuroscientists around the world.

See Addendum for References for Alternative Therapy articles

11. Treatment Monitoring

- A face to face follow up visit is recommended by the fourth week of medication, during which the clinician reviews the responses to the varying doses of medication and can monitor side effects including weight, pulse, and blood pressure.

- A general guide for visits is initially on a monthly basis until the optimal response is found and then every 3 months for the first year of treatment.

- Subsequent visits will depend on the response but should occur at least 2 times per year, until it is clear that target goals are progressing and stable and then periodically as determined by the family and clinician.

- Whenever possible, improvements in core symptoms and target goals should be monitored in an objective way by use of one of the DSM 5 approved rating scales.
scales, such as the Vanderbilt ADHD follow up scales in close cooperation with school and home settings.
- The AAP/NICHQ have excellent examples of follow up tools to use with families: see Addendum

12. Other management considerations
- AAP states that ADHD should be considered as a Special Health Care Need.
- Management of ADHD should follow the principles of the chronic care model and medical home.

13. Parent Resources
- Books
  - Raising Resilient Children: Fostering Strength, Hope and Optimism in Your Child, Brooks and Goldstein
  - Attention Deficit Disorder: The Unfocused Mind in Children and Adults, Tom Brown, PhD
  - ADHD and Executive Function Disorders (Children): Late, Lost, and Unprepared: A Parents’ Guide to Helping Children with Executive Functioning, Cooper-Kahn
  - The Explosive Child: A New Approach for Understanding and Parenting Easily Frustrated, Chronically Inflexible Children, Greene
  - Parenting Children with ADHD: 10 Lessons That Medicine Cannot Teach, Monastra, Phd
  - Raising Boys with ADHD: Secrets for Parenting Healthy, Happy Sons, Richey and Forgan
  - Driven to Distraction (Revised): Recognizing and Coping with Attention Deficit Disorder, Hallowell, MD and Ratey, MD
  - Smart but Scattered: The Revolutionary "Executive Skills" Approach to Helping Kids Reach Their Potential, Dawson and Guare
  - The ADHD Workbook for Teens: Activities to Help You Gain Motivation and Confidence, Honos-Webb
  - Teenagers with ADD and ADHD: A Guide for Parents and Professionals, Dendy
- Websites
  - Children and Adults with ADHD: www.chadd.org
  - Parents Med Guide: www.parentsmedguide.org
  - Teach ADHD: http://teachadhd.com/
  - National Resource Center on ADHD: www.help4adhd.org
- Local specialists
  - PEARL Clinic Seattle Childrens Hospital: 206 987-2164
  - Hallowell Todaro Centers: https://www.hallowelltodarocenter.org