Why It's So Hard to Focus and What I can do About It:

A KCOM Alum Psychiatrist's Perspective

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Slides available at
DrJonathanTerry.com/KCOMADHD

What is your differential diagnosis?

A 24-year-old OMS I with no past medical history presents to clinic with a chief complaint of difficulty concentrating and trouble completing classwork.

Write down 10 items in your differential diagnosis

Overview: What are Focus and attention?

Cognitive processes that allow us to selectively concentrate on one aspect of our environment while ignoring other things.

In academic and professional settings, the ability to maintain focus significantly impacts performance and productivity.

Focus and Attention are the gateways to *all other aspects of cognition*, such as memory and problem-solving.

Prevalence: Attention difficulties are **common**, affecting people of all ages. According to the American Psychiatric Association, about 3-7% of children have Attention Deficit Hyperactivity Disorder (ADHD), a condition characterized by persistent issues with attention.

They are critical for daily functioning, allowing us to perform tasks efficiently, learn new information, and solve problems.

Many adults struggle with focus, whether due to ADHD, stress, or other factors.

What Influences Our Ability to Focus?

Biological Factors:

- Our brain's structure and function play a significant role in our ability to focus.
- Key neurotransmitters (e.g dopamine), and brain regions (e.g. prefrontal cortex), are involved in attention and focus.

Environmental Factors:

- Our surroundings impact our ability to concentrate.
- **Distractions**, high levels of stress, and sleep disturbances can all impair focus.

Behavioral Factors:

- Certain habits and behaviors can also affect our focus.
  - **Multitasking** can lead to decreased productivity and focus.
  - **Poor time management** can also contribute to difficulties in maintaining attention.

Disorders that affect focus and attention

Attention Deficit Hyperactivity Disorder (ADHD): This is a neurodevelopmental disorder that affects both children and adults. Symptoms include difficulty maintaining focus, hyperactivity, and impulsivity.

Executive Functioning Deficits: Executive functions are a set of cognitive processes that include working memory, cognitive flexibility, and inhibitory control. Deficits in these areas can lead to difficulties with focus, planning, organization, and task completion.

Cognitive Impairments in Neurological Conditions: Various neurological conditions, such as stroke, traumatic brain injury, and neurodegenerative diseases, can lead to cognitive impairments, including difficulties with attention and focus.

Clinical Characteristics: ADHD

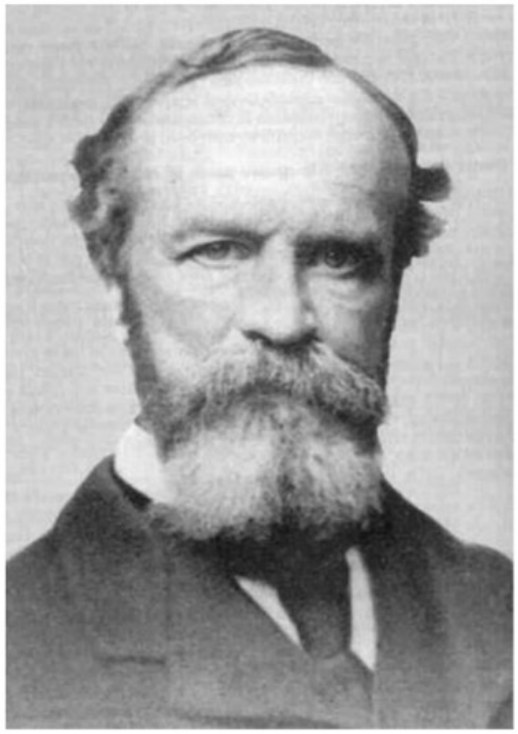
some combination of severe inattention, hyperactivity, and impulsivity that begins in childhood, and often persists into adult yrs.

Must cause functional impairment across settings, and must be developmentally relevant

some symptoms should be present before age 7-12

History of ADHD

- William James (1890)
"There is a normal type of character, for example, in which impulses seem to discharge so promptly into movements that inhibitions get no time to arise. These are the 'dare devil' and mercurial temperaments overflowing with animation and fizzling with talk."



Epidemiology

3-7% of school-age children

boys 4-9x > girls

The Cognitive Process of Attention

- ADHD is a genetic, neurobiological disorder that affects one's ability to regulate impulse control, motor activity, and attentiveness.

Cognitive Process of Attention:

- Detecting a stimulus (focusing).
- Processing the detecting information.
- Sustaining attention to the relevant stimulus.
- Inhibiting involuntary shifting (distractibility).
- Organizing a response to the stimulus.

It's About Executive Function

Executive function *can be divided into the following tasks:*

- **Working memory** - where we select bx responses from past successes
- **Motor control** - planning movements and inhibiting non-planned ones
- **Regulating emotions** - such as frustration tolerance and reactivity
- **Motivation** - controls starting tasks and persisting until completion
- **Planning** - ability to organize, develop and implement a plan of action

Executive functions *are controlled in three areas of the brain:*

- **Frontal lobe** - pre-frontal cortex and pre-motor cortex in particular
- **Basal ganglia** - control gaiting and initiating/inhibiting all events
- **Cerebellum** - controls coordinating brain activity/events

The core problem in ADHD seems to be with response inhibition

ADHD Through Development

- **Infants**
  - more active in utero
  - more sleeping and feeding difficulties
  - increased colic and crying
  - more difficult temperaments
  - associated with maternal cigarette and etoh use, low birth weight and brain injuries in utero

- **Preschool**
  - mean age of onset for H type is 4.21 years
  - mean age of onset for C type is 4.88 years
  - difficulty sitting still and being read to, noncompliance, temper tantrums
  - parents state they need to child-proof the home, must provide more supervision, have difficulties with babysitters and day care settings

ADHD Through Development

School Age

- school accentuates problems: high rates of off-task behaviors, noncompliance, temper tantrums
- at risk for learning/academic problems: 3x more likely to be retained, often children retained as "immature"
- poor social skills; at risk for social rejection
- hyperactive types (98%) and combined types (82%) usually meet criteria and are impaired by age 7yo
- By late childhood, 30-50% develop sx of conduct disorder such as fighting, stealing, truancy

Adolescence

•50-70% continue to have poor attention, impulse control, although hyperactivity diminishes

•many inattentive types (?20-30%?) may not become impaired and met criteria until middle school

•30% drop out of high school compared to 10% for normal controls; 5% of ADHD students go to college vs 41% of normal controls

•increased risk for car accidents, substance abuse, juvenile delinquency

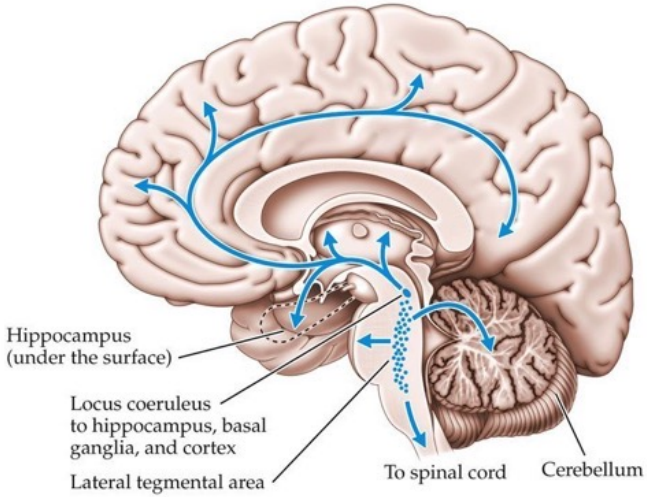
•25-35% of ADHD children will be referred to juvenile court at least one time

Adulthood

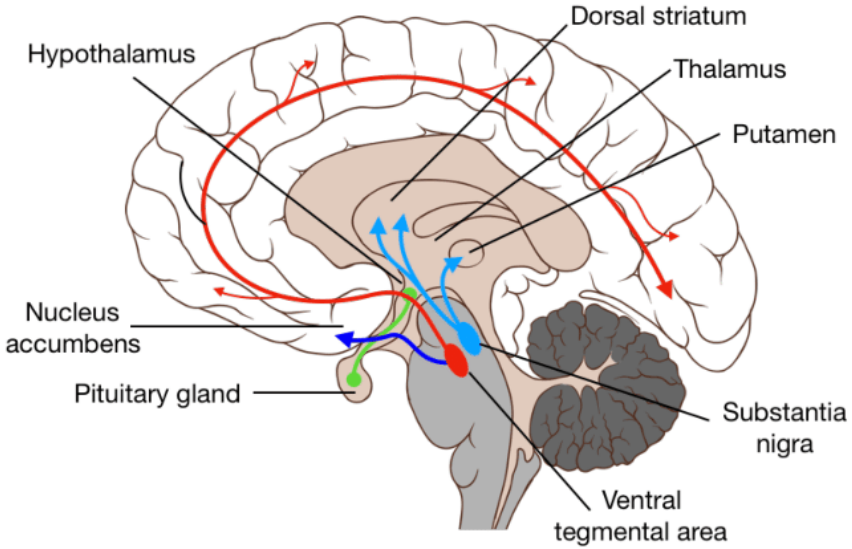
- difficulties with attention, impulsivity, organization, but not hyperactivity (may be subjectively restless)
- more likely to quit jobs, to be seen by employers as less capable
- lower SES than unaffected siblings
- low self-esteem, increased divorce rates
- increased risk for adult psychopathology including depression, suicide
- 40% of ADHD children have inadequate social adjustment in adulthood

Noradrenergic Pathways in the Brain

Noradrenergic fibers from the locus coeruleus project broadly



BIOLOGICAL PSYCHOLOGY 7e, Figure 4.5



Mesolimbic pathway

Mesocortical pathway

Nigrostriatal pathway

Tuberoinfundibular pathway

Neuroimaging

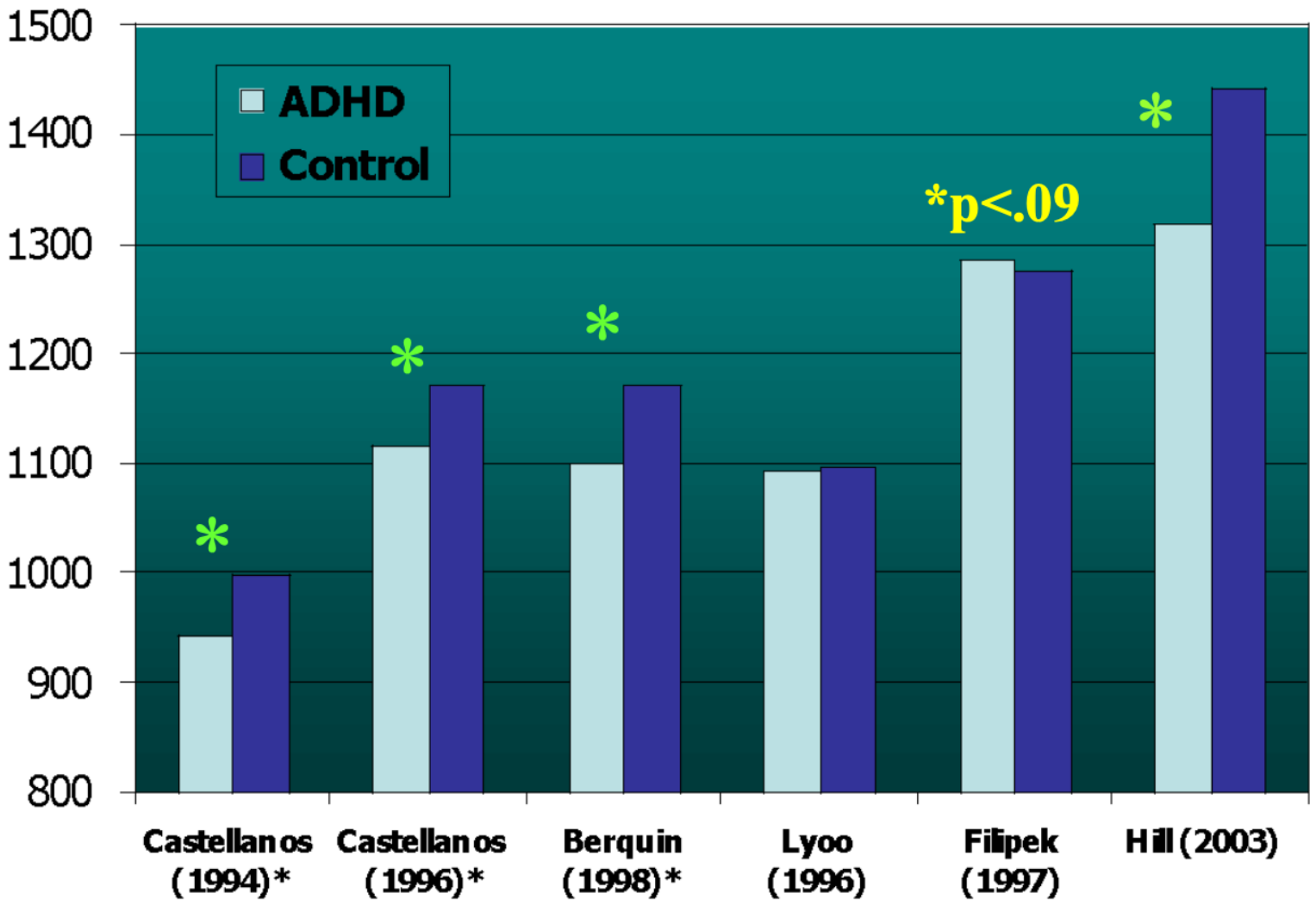
- **MRI**
  - Loss of the normal L > R asymmetry, smaller brain volumes of specific structures, esp. L caudate, smaller white matter vol of R frontal lobe
    - PFC, BG--both rich in DA receptors
      - 5-10% decrease in volume
    - Decreased volume of anterior-superior hemisphere
  - 5% decrease in R cerebellar volume, 4% reduction in intracranial volume; Unaffected siblings: up to 9% decrease in selected prefrontal and occipital areas

Durston, et al (2004): *J Amer Acad Child Adol Psychiatry*; 43(3); 332-340

Essential Research

- Functional studies (PET, SPECT, quantitative EEG, etc.)
- **Frontal lobes** - multiple modalities show decreased activity in the frontal lobes during concentration
  - The difference in females is the most profound
  - Subjects had increased theta waves (slow waves) during concentration in their frontal lobes (Lubar)
- **Limbic regions** - had increased activity with decrease frontal lobe activity on SPECT (Amen)
- **Parietal lobes** - increased activity vs controls (Amen)
- Chabot et al. found 11 distinct patterns on **QEEG** associated with ADHD, some of which predicted good response to certain meds, but poor response to other ones

ADHD Whole Volume Brain Studies



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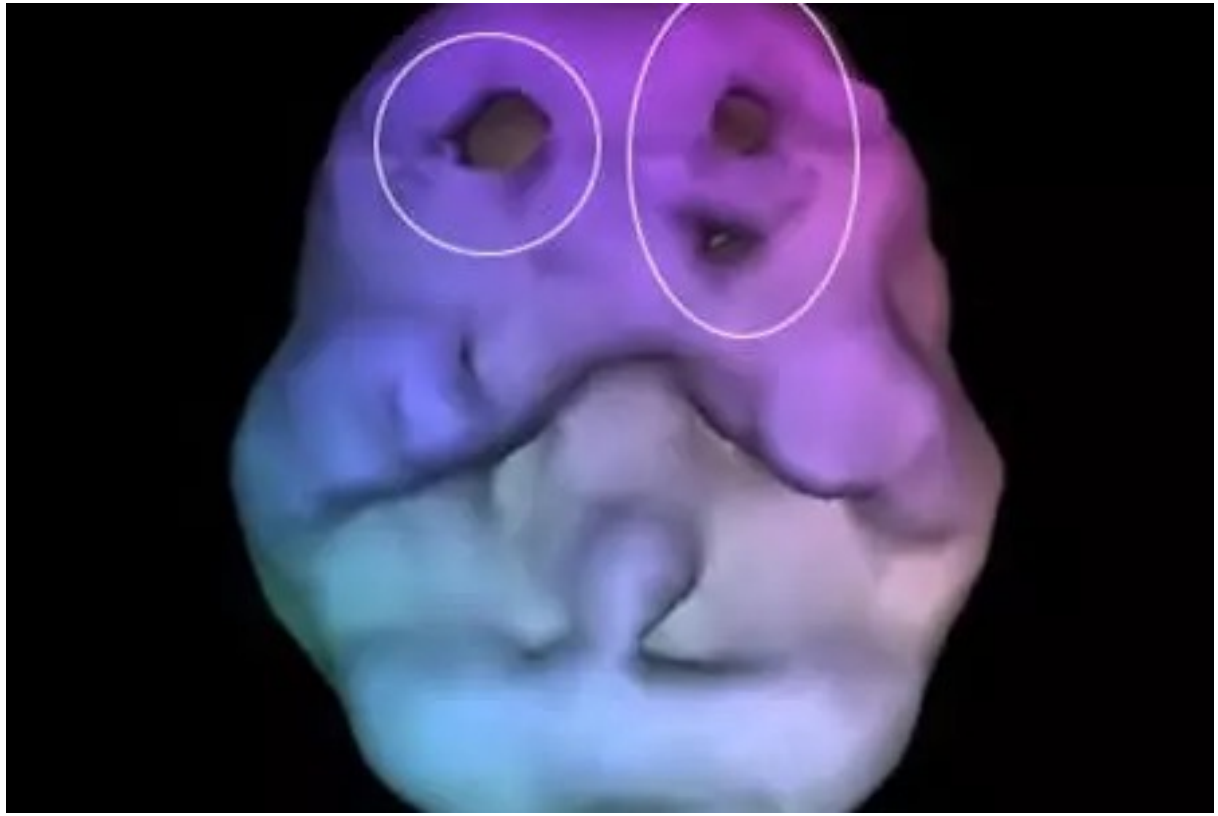

SPECT

Consequences of Struggling with Focus

Academic Challenges: Attention difficulties can lead to poor academic performance and learning difficulties. Students may struggle to keep up with coursework, understand complex concepts, or stay organized.

Occupational Issues: In the workplace, attention difficulties can lead to reduced productivity, missed deadlines, and job dissatisfaction. These issues can impact career progression and overall job satisfaction.

Personal Consequences: Attention difficulties can also have personal consequences. They can lead to relationship problems due to misunderstandings or perceived lack of interest. Additionally, chronic struggles with focus can lead to low self-esteem and increased stress.

The Public Health Case

Earlier age at first intercourse (15.4yo vs 16.5yo)	More unintended teen pregnancies (38% vs 4%)	Four times higher STD's
2-3x more MVA's, 9x more traffic tickets	Greater use of medical services, especially ER's	2-3x more arrests, 9x more convictions in teens
2x higher substance use disorders	60-70% rates of ADHD in prisoners (3 studies) and 30-40% rates in one other study	Treatment of ADHD resulted in increased rehab, fewer parole violations and earlier parole in one study

Why do we treat ADHD?

1. Prevention of academic/occupational failure.
2. Decrease the risk of substance use disorders.
3. Safety while driving and to prevent accidents and impulsive aggression.
4. Improve social skills and social functioning.
5. Improve relationships and prevent divorce.
6. Maintain parental/care taker sanity and to prevent physical abuse of the child.

Diagnostic Considerations in Adults

Ruling out of underlying conditions	DSM-5	ASRS
UTox	Pregnancy Test	Family history (sudden death)
Height, Weight	Risks vs. benefits	NO Dx by med trial

Tools and Techniques to Enhance Focus

Mindfulness and Meditation Techniques: Mindfulness involves paying attention to the present moment without judgment. Regular mindfulness meditation can help improve focus by training the brain to better concentrate on tasks at hand.

Cognitive-Behavioral Strategies: Cognitive-behavioral therapy (CBT) can be used to improve focus by helping individuals recognize and change unhelpful thought patterns and behaviors. Techniques may include goal setting, self-monitoring, and developing problem-solving skills.

Organization and Time Management Tools: Using tools such as calendars, to-do lists, and time-blocking techniques can help manage tasks more effectively, reducing cognitive load and improving focus.

Healthy Habits for Better Focus

Regular Exercise: Regular physical activity has been shown to improve cognitive functions, including attention and memory. Exercise increases blood flow to the brain and releases chemicals that promote neural health.

Healthy Diet and Nutrition: A balanced diet rich in fruits, vegetables, lean proteins, and whole grains can support brain health. Certain nutrients, like omega-3 fatty acids, are particularly beneficial for cognitive functions.

Adequate Sleep and Sleep Hygiene: Good sleep is essential for cognitive functions, including focus. Establishing a regular sleep schedule, creating a restful environment, and avoiding screens before bedtime can improve sleep quality and, in turn, attention.

Randomized Controlled Trial > J Am Osteopath Assoc. 2014 May;114(5):374-81.
doi: 10.7556/jaoa.2014.074.

Effect of osteopathic manipulative therapy in the attentive performance of children with attention-deficit/hyperactivity disorder

Alessandro Accorsi [1], Chiara Lucci, Lorenzo Di Mattia, Cristina Granchelli, Gina Barlafante, ·derica Fini, Gianfranco Pizzolorusso, Francesco Cerritelli, Maurizio Pincherle

movement is life

Home Osteopathy

OSTEOPATHY CAN TREAT ATTENTION DEFICIT DISORDER

Osteopathy can treat Attention Deficit Disorder – Hyperactivity Disorder(ADD/ADHD) is characterised by poor attention span, impuls
behaviours, and hyperactivity. To be diagnosed with ADD/ADHD, you or your child must display a combination of strong ADD/ADH
symptoms, namely hyperactivity, impulsivity, or inattention. It is recommended getting diagnosed by a mental health professional
hat you or your child may be ADHD.

Possible causes of ADD/ADHD include adverse responses to chemicals and additives in processed or chemically tainted food,
environmental chemicals, exposures to neurodevelopmental toxins, such as heavy metals and history of a traumatic birth.

Osteopaths seek to resolve structural issues in the body. Problems of labour and delivery that may have compromised the stru
head and spine and thus disturb the nervous system within, which may interfere with its physiological development.

The Influence of Osteopathy on ADHD

Master Thesis to obtain the degree
Master of Science in Osteopathy

at the **Donau Universität Krems**
deposited
at the **Wiener Schule für Osteopathie**

by ***Birgit Hubmann***

Stainz, November 2006
Supervised by Sabine Kollingbaum-Fabian
Translated by Helga Klinger-Groier

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EVIDENCE-BASED CLINICAL REVIEW

Treatment of Adults With Attention-Deficit/Hyperactivity Disorder

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Michele T. Pato, MD
Rebecca L. Cyr, BA

Attention-deficit/hyperactivity disorder (ADHD) is a clinically important neuropsychiatric developmental dis-

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The Role of Medication in Managing Attention Disorders

Medication can be a valuable tool in managing attention disorders like ADHD. It can help improve focus, reduce impulsivity, and enhance the ability to follow through on tasks.

The two main types of medications used to treat attention disorders: **stimulants** and **non-stimulants.** Stimulants work by increasing the levels of dopamine in the brain. Non-stimulants work differently but also help improve focus and attention.

Benefits vs Adverse Effects: While these medications can significantly improve symptoms of attention disorders, they also come with potential side effects.

These can include sleep problems, decreased appetite, mood swings, headaches, risk of seizures, cardiac death, psychosis, growth suppression, and more.

Treatments

Established Treatments

- Psychostimulants (1st line)
- Atomoxetine (1st line)
- Bupropion (2nd line)
- Tricyclic antidepressants (TCAs: 2nd line)
- Guanfacine extended release, recently FDA approved as Intuniv, for ages 6-17

Probable Efficacy

- Alpha-2 agonists (clonidine, guanfacine)
- Modafinil

Treatments, cont.

Possible efficacy

- Omega 3-6-9 Fatty Acids
  - For excellent review, see Freeman, et al. Jnl Clin Psychiatry 2006

Effective, but impractical: MAOIs

Likely ineffective

- SSRIs
- Caffeine
- St. John's Wort

The Importance of Professional Support

Evaluation and Diagnosis: If you're struggling with focus and attention, it's important to seek professional help. A thorough evaluation can help identify the cause of your difficulties and guide treatment strategies.

The Role of Mental Health Professionals: Psychiatrists, psychologists, and other mental health professionals play a crucial role in diagnosing and treating attention disorders. They can provide a range of services, including psychoeducation, therapy, and medication management.

Collaborating with Healthcare Providers for Effective Management: Effective management of attention difficulties often involves a team approach. This can include working with primary care physicians, psychiatrists, therapists, and other healthcare providers.

Managing Attention Difficulties in Medical School

Balancing Academic Demands and Self-Care: Medical school is demanding, but it's important to prioritize self-care. Regular exercise, adequate sleep, and healthy eating can help maintain cognitive function and overall wellbeing.

Time Management Tips for Improved Focus: Effective time management can significantly improve focus. Techniques might include setting specific study goals, breaking tasks into manageable chunks, and scheduling regular breaks.

Utilizing Campus Resources for Support: Many universities offer resources to support students with attention difficulties. These might include academic support services, counseling centers, and disability services.

Coping Strategies: Preventing or Managing Burnout

Use Time Wisely: Medical school requires tremendous amounts of energy and focus. It may be tempting to sign up for numerous research opportunities, volunteer, and extracurricular activities, but is it vital to find a balance between work and play.

Schedule in Self Care: Self-care cannot be an afterthought. As you plan out your day you need to schedule in self-care. Self-care can look different for everyone but can include a walk, exercising at the gym, spending time with friends and family, watching a tv show. No matter what it is for you, work towards integrating it into your daily schedule.

Community: We are social creatures. To not only survive, but thrive in medical school we need support systems. It is healthy to spend time with others to gain support and encouragement.

Overcoming Attention Difficulties: Real-Life Examples

Case Study 1: A medical student with ADHD who struggled with focus during lectures. By working with a learning specialist, they developed a strategy of active listening and note-taking that improved their focus and retention of information.

Case Study 2: A medical student who had difficulty managing their time effectively due to attention issues. By using time management tools and techniques, they were able to structure their day more effectively, improving their focus and reducing stress.

Discussion: These case studies highlight the importance of **individualized approaches** to managing attention difficulties. What works for one person may not work for another, so it's important to explore different strategies and find what works best for each individual


A.T. STILL UNIVERSITY
KIRKSVILLE COLLEGE OF OSTEOPATHIC MEDICINE
Class of 2009

Wrapping Up: Enhancing Focus and Attention

Recap of Key Points: We've discussed the importance of focus and attention, the factors that can affect them, common attention disorders, and the impact of these difficulties. We've also explored various strategies to improve focus, the role of medication, and the importance of seeking professional help.

Encouraging Proactive Measures: It's crucial to take proactive steps to enhance focus and attention. This can include practicing mindfulness, improving time management skills, making lifestyle modifications, and seeking professional help when needed.

Emphasizing the Importance of Seeking Support: If you're struggling with attention difficulties, remember that help is available. Don't hesitate to reach out to mental health professionals or utilize campus resources.

References

- American Psychiatric Association. (2013). Diagnostic and Statistical Manual of Mental Disorders (5th ed.). Arlington, VA: American Psychiatric Publishing.
- Arnsten, A. F. (2009). Toward a new understanding of attention-deficit hyperactivity disorder pathophysiology: an important role for prefrontal cortex dysfunction. CNS Drugs, 23(S1), 33-41.
- Barkley, R. A. (2014). Attention-deficit/hyperactivity disorder (ADHD). Nature Reviews Disease Primers, 1, 15020.
- Dyrbye, L. N., Thomas, M. R., Shanafelt, T. D. (2005). Medical student distress: Causes, consequences, and proposed solutions. Mayo Clinic Proceedings, 80(12), 1613-1622.
- Eddy, L. D., Hoekzema, G. S., Brownell, A. K., Serpell, Z. N., Reedy, Z. N. (2023). Overcoming Attention Difficulties in Medical School: A Comprehensive Guide. Journal of Medical Education and Training.
- Faraone, S. V., & Buitelaar, J. (2010). Comparing the efficacy of stimulants for ADHD in children and adolescents using meta-analysis. European Child & Adolescent Psychiatry, 19(4), 353-364.
- Grandner, M. A., Hale, L., Moore, M., & Patel, N. P. (2010). Mortality associated with short sleep duration: The evidence, the possible mechanisms, and the future. Sleep Medicine Reviews, 14(3), 191-203.
- Karatsoreos, I. N., & McEwen, B. S. (2013). Annual Research Review: The neurobiology and physiology of resilience and adaptation across the life course. Journal of Child Psychology and Psychiatry, 54(4), 337-347.
- Kessler, R. C., Adler, L. A., Barkley, R., Biederman, J., Conners, C. K., Demler, O., ... & Zaslavsky, A. M. (2006). The prevalence and correlates of adult ADHD in the United States: Results from the National Comorbidity Survey Replication. American Journal of Psychiatry, 163(4), 716-723.
- Miyake, A., Friedman, N. P., Emerson, M. J., Witzki, A. H., Howerter, A., & Wager, T. D. (2000). The unity and diversity of executive functions and their contributions to complex “Frontal Lobe” tasks: A latent variable analysis. Cognitive Psychology, 41(1), 49-100.
- Posner, M. I., & Petersen, S. E. (1990). The attention system of the human brain. Annual Review of Neuroscience, 13(1), 25-42.
- Ratey, J. J., & Loehr, J. E. (2011). The positive impact of physical activity on cognition during adulthood: A review of underlying mechanisms, evidence and recommendations. Reviews in the Neurosciences, 22(2), 171-185.
- Singh, I. (2008). Beyond polemics: Science and ethics of ADHD. Nature Reviews Neuroscience, 9(12), 957-964.
- Solanto, M. V. (2011). Cognitive-behavioral therapy for adult ADHD: Targeting executive dysfunction. New York, NY: Guilford Press.
- Spencer, T. J., & Biederman, J. (2009). Nonstimulant treatment for attention-deficit/hyperactivity disorder. Journal of Attention Disorders, 13(3), 211-217.
- Visser, S. N., Danielson, M. L., Bitsko, R. H., Holbrook, J. R., Kogan, M. D., Ghandour, R. M., ... & Blumberg, S. J. (2014). Trends in the parent-report of health care provider-diagnosed and medicated attention-deficit/hyperactivity disorder: United States, 2003–2011. Journal of the American Academy of Child & Adolescent Psychiatry, 53(1), 34-46.
- Wehrwein, P. (2005). Six steps to better time management. Monitor on Psychology, 36(7), 70.
- Willcutt, E. G., Pennington, B. F., Olson, R. K., Chhabildas, N., & Hulslander, J. (2005). Neuropsychological analyses of comorbidity between reading disability and attention deficit hyperactivity disorder: In search of the common deficit. Developmental Neuropsychology, 27(1), 35-78.
- Zylowska, L., Ackerman, D. L., Yang, M. H., Futrell, J. L., Horton, N. L., Hale, T. S., & Smalley, S. L. (2008). Mindfulness meditation training in adults and adolescents with ADHD: A feasibility study. Journal of Attention Disorders, 11(6), 737-746.