APSARD
The American Professional Society of ADHD and Related Disorders

APSARD 2025

ABSTRACT BOOK

San Diego

JANUARY 16-19
Loews Coronado

THURSDAY, JANUARY 16, 2025

ADHD 201

100 PM – 5:00PM

ADHD 201

Chair: Gregory Mattingly, Midwest Research Group

Presenters:

Brooke Molina, University of Pittsburgh

Betsy Busch, Tufts University

Ann Childress, Center for Psychiatry and Behavioral Medicine, Inc.

Margaret Sibley, University of Washington

Gregory Mattingly, Midwest Research Group

Treatment of ADHD after an Inadequate Response to Stimulants

Ann Childress, Center for Psychiatry and Behavioral Medicine, Inc.

Challenges and Opportunities when Treating College Students with ADHD

Betsy Busch, Tufts University

Moving beyond symptom treatment: Clinical practice strategies for reducing misuse through diversion risk reduction

Brooke Molina, University of Pittsburgh

Is it really ADHD?: A guide to confident adult ADHD assessment.

Margaret Sibley, University of Washington

Complex, Comorbid and Connected: Evidence based strategies to improve outcomes in complicated patients

Gregory Mattingly, Midwest Research Group

FRIDAY, JANUARY 17, 2025

***Exhibitor Spotlight Session*, with Breakfast, presented by Vertical Pharmaceuticals**

7:00 AM – 7:45AM

Opening Conference Plenary: Gender and Endocrine Issues in ADHD

08:00 AM - 09:30 AM

Opening Conference Plenary: Gender and Endocrine Issues in ADHD

Chair: Margaret Sibley, University of Washington

Presenters:

J.J. Sandra Kooij, PsyQ, Program Adult ADHD, The Hague

Julia Schechter, Duke University Medical Center

Lotta Borg Skoglund, Uppsala University, Sweden; Karolinska Institutet, Sweden

Margaret Sibley, University of Washington

Overall Abstract: Increasing numbers of women present for ADHD treatment in adulthood, particularly during the menopausal transition. In this plenary, Dr. Sandra Kooij will present emerging research on women with ADHD during this developmental period. A panel, including Drs. Julia Schechter and Dr. Charlotte Borg Skoglund, will follow.

Learning Objective 1: Participants shall be able to identify common challenges faced by women with ADHD during the menopausal transition.

Learning Objective 2: Participants shall be able to discuss the diagnostic and treatment complexities associated with ADHD during the menopausal transition.

Learning Objective 3: Participants shall be able explain the impact of hormonal fluctuations on cognitive and physical health in women with ADHD during the peri-menopausal and menopausal transitions, and evaluate the role of hormonal therapy in managing these symptoms.

Impact of Losing Female Hormones in Women With ADHD During (Peri)-Menopause

J.J. Sandra Kooij, PsyQ, Program Adult ADHD, The Hague

Hypothesis/Objective: For decades, women have been neglected by scientific research for the very reason of having a menstrual cycle with hormonal fluctuations, that could potentially disturb any measurements, and therefore make them unreliable research subjects.

We are now facing the consequences of the scientific neglect of women in general. At the end of their fertile life phase, women not only start loosing their youth, also their children leave home, their physical health is getting more problematic, and their cognitive capabilities seem to evaporate. They feel out of control, while everyone keeps saying that peri-menopause is a normal aging process that occurs to everyone that one should learn to handle. Having severe symptoms that are denied by the environment including doctors, often leaves women in desperation. To date, only 20% of women does not suffer from menopausal transition, while 80% does (El Khoudary 2019).

Methods: From my own experience, I learned the impact of hormones at age 36, when I lost them after my last IVF attempt. In very short time I lost the ability to think, to work, to function at all. I felt tired as if I was suddenly 80 years old, and developed mood and anxiety symptoms. I luckily understood the cause of my health problems and got hormonal therapy which made all complaints disappear, in just one week. This premature ovarian insufficiency needs hormonal supplementation right away in order to prevent serious bone, heart and mood disorders over time.

A premature menopause occurs more frequently in women with ADHD, esp. when they are smoking, but this is still unknown to clinicians (Demontis 2019). As they commonly already suffer from severe premenstrual depression, it may seem as if the symptoms start earlier every month until they are impaired during most of the cycle. Without knowledge among doctors about this hormonal dysregulation in ADHD, there is no help available for these women, they end up in depression and may loose partner and job as a consequence.

Results: Women with ADHD report a 2-3 fold increased rate of PMDD (45%) and PPD symptoms (58%), compared to women in the general population (Dorani 2021). Vice versa, among women with PMDD and PPD, the prevalence of ADHD is increased (Andersson 2023). The interaction between low estrogen levels x low or dysregulated dopamine levels in ADHD may explain why women with ADHD develop much more severe hormonal mood symptoms than others and are often unable to function. The longer it takes, the more severe the impact is, as in (peri)-menopause, when hormones over a period of ten years slowly disappear, to never return.

Hormones, especially estrogen also protects cardiovascular health and bone density, leading to increased rates of heart infarction or stroke during (peri)-menopause in women in general. Heart infarction is the number one cause of death in women around age 50-60. That there may be a reason for extra concern in women with ADHD showed our study in a cardiology clinic, where 35% of 300 consecutive perimenopausal women screened positive for ADHD, and their mean age was 2 years younger compared to the other women (Ter Beek 2023).

Conclusions: Ongoing research in women with ADHD at the Dutch Expertise Center Adult ADHD in the Netherlands will be discussed with the audience.

Hormonal Contraceptive Use and Risk of Depression Among Young Women With ADHD

Lotta Borg Skoglund, Uppsala University, Sweden; Karolinska Institutet, Sweden

Hypothesis/Objective: Women with ADHD have an increased risk for psychiatric comorbidity as well as for sexual risk-taking behaviours. Safe and effective contraception can delay childbirth and increase the opportunity for psychosocial equality for girls and women with ADHD. Adverse effects of hormonal contraception, including depression, may affect adherence to user-dependent contraception and increase the risk for unplanned pregnancies and teenage birth in women with ADHD.

Methods: This seminar will discuss a nationwide population-based prospective cohort study of women aged 15 to 24 years between January 1sts 2010 and December 31st, 2017, aiming to

determine whether women with ADHD are at increased risk for depression during hormonal contraceptive use compared with non-ADHD women.

Results: The population-based study Hormonal Contraceptive Use and Risk of Depression Among Young Women with Attention-Deficit/Hyperactivity Disorder published in the Journal of the American Academy of Child and Adolescent Psychiatry, included 792 913 women aged 15 to 24 years, and showed a threefold higher risk of developing depression in ADHD-women compared to non-ADHD women, irrespective of hormonal contraceptive use (aHR 3.69 (95% CI 3.60-3.78)).

Women with ADHD using oral hormonal contraceptive had a five times higher risk of depression compared with non-ADHD women not using combined oral hormonal contraceptives; aHR 5.19 (95% CI 4.94 – 5.47). The risk of developing depression when using non-oral HC was similarly moderately increased in both groups.

Thus, women with ADHD have an increased risk of developing depression when using oral hormonal contraceptive compared with their unaffected pears. In this seminar will suggest that safe, tolerable, and effective contraceptives such as long-acting reversible contraceptives should be considered in women with ADHD.

Conclusions: Safe and effective contraception to delay childbirth is critical to increase female opportunities for a solid psychosocial platform for themselves and their children. Still, girls and women with ADHD are six times more likely to become teenage mothers. Clearly, since it easy to access contraceptives, free of charge, young women with ADHD fail to act on contraceptive counselling. Our studies indicate that an increased risk for depression while using hormonal contraceptives can be part of the problem. In this talk we discuss the importance of finding safe and effective contraception for girls and women with ADHD to prevent psychosocial inequality to transmit between generations.

Panel Discussion About Hormones and ADHD During Perimenopause and Across Reproductive Lifespan

Julia Schechter, Duke University Medical Center

Hypothesis/Objective: Dr. Schechter will join the panel to provide expertise on the relationship between ADHD and hormones across the lifespan. As the co-director of the Duke Center for Girls and Women with ADHD, Dr. Schechter will share perspectives from patients and families who have engaged with the Center. Additionally, she will discuss findings from the Center's recently completed Patient-Centered Outcomes Research Institute (PCORI) engagement award. This project aimed to identify the research priorities of girls and women with ADHD, their families, and their communities, resulting in the largest patient-informed research agenda focused specifically on the needs of ADHD girls/women and individuals assigned female at birth (AFAB).

Methods: Dr. Schechter will provide background on the founding of the Duke Center for Girls and Women with ADHD and its educational, outreach, and research initiatives. She will describe the methods used in the PCORI project, which involved seven "listening and learning sessions"

held with ADHD girls and women and other key community partners to learn about their experiences living with and supporting ADHD individuals. She will explain the thematic analyses of these sessions, which identified unique research themes that were subsequently prioritized by patients and community members via a survey using forced-ranking methodology.

Results: Dr. Schechter will discuss some of the Duke Center's work and the outcomes of the PCORI project. She will share the 46 unique research themes identified through the thematic analyses and highlight the themes most highly prioritized by the 1383 survey respondents. In particular, Dr. Schechter will emphasize that the research theme "The role of hormones on how ADHD shows up and is treated for girls and women" was the top-ranked topic across all respondent groups, including ADHD girls/women and AFAB people (N=1166), parents of ADHD girls (N=443), educators (N=207), medical providers (N=51), and mental health providers (N=122). Notably, when analyzed by menopausal status, the top priority for menopausal (N=115) and post-menopausal women (N=289) shifted to, "Connection between aging, cognitive decline, and ADHD for post-menopausal women with ADHD."

Conclusions: Dr. Schechter will bring insights from her leadership of the Duke Center for Girls and Women with ADHD to the panel, highlighting the PCORI project findings that demonstrate a consensus among ADHD girls/women, their families, and communities on the importance of studying the role of hormones in ADHD. Although priorities varied by hormonal status, the influence of reproductive biology on ADHD symptoms remained a key theme. Dr. Schechter's contribution will emphasize the importance of incorporating the patient voice into the plenary discussion, a perspective essential for advancing health equity and addressing the sex-specific and gender-influenced disparities often experienced by girls and women with ADHD.

A Tailored Treatment for Adults with ADHD, presented by Noven

9:45 AM – 10:45 AM

The African American Experience With ADHD

10:45 AM - 12:15 PM

The African American Experience With ADHD

Chair: Napoleon Higgins, Bay Pointe Behavioral Health Service, Inc.

Presenters:

Brandi Walker, Henry Jackson Foundation/ Marie Pauline Consulting LLC/ CHADD

Corey Hebert, LSU

Overall Abstract: The intersection of ableism and historical racism in the United States highlights a complex legacy of oppression rooted in colonialism, chattel slavery, and systemic inequities. This paper examines how colonial practices of distinguishing "haves" and "have-nots" have disproportionately marginalized individuals through ableism, particularly within African American communities. The enduring impact of slavery continues to shape diagnostic, assessment, and treatment disparities, perpetuating cycles of exclusion and discrimination. From

inadequate prenatal care to disproportionate placement in juvenile detention and eventual incarceration, Black Americans experience compounded marginalization through the combined forces of racism and ableism throughout their lifespan. These systemic barriers persist across socioeconomic strata, underscoring the pervasive intertwining of racism and ableism as tools of subjugation and classism. This analysis seeks to explore these historical and contemporary dynamics, offering insight into how inequities perpetuated by racism and ableism can be dismantled.

Learning Objective 1: Understand the historical relationship between colonialism, chattel slavery, and the systemic marginalization caused by racism and ableism, particularly affecting African Americans.

Learning Objective 2: Analyze how intersections of racism and ableism perpetuate disparities in diagnosis, assessment, treatment, and social outcomes across the lifespan.

Learning Objective 3: Identify actionable strategies to address systemic inequities caused by racism and ableism, focusing on dismantling discrimination in healthcare, education, and criminal justice systems.

Panel Discussion: Advancing Diagnosis and Interventions of ADHD/Neurodiversity in Under-Privileged Communities

Brandi Walker, Henry Jackson Foundation/ Marie Pauline Consulting LLC/ CHADD

Hypothesis/Objective: 1.) Trajectories of untreated ADHD/neurodiversity in young BIPOC, under-privileged adults and teenagers, are indicative of chronic unhealthy lifestyle patterns that often lead to secondary diagnoses and negative outcomes

2.) Developing community-intentioned and accessible resources, education, and opportunities to promote self-help/care and self-sustainability

3.) Endeavor in learning about and engaging in an operationalized public health collaborative initiative to intercept the school to prison pipeline for neurodiverse students/young adults via screening, diagnosis, and accessible treatment

Methods: Strategic discussion and planning for an operationalized public/community health collaborative research initiative designed to sample a portion of the population (100 undiagnosed high school students and 100 undiagnosed young adults from age 19-26) who self-identify with numerous lived experiences of chronic, executive dysfunction. Screening and ADHD/neurodiversity psychological testing, followed by accessible pharmaceutical and non-pharmaceutical treatment interventions and connectivity to practical resources, promoting accountability to society, higher quality of life, and reduction in multi-billion-dollar economic burdens.

Results: Results would follow execution of proposed public health research collaborative on the 200 sample participants and their screening/testing findings. Additionally, results from non-pharmaceutical and pharmaceutical interventions would also be discussed.

Conclusions: Findings would yield critical lessons learned on ways various organizations, providers, pharmaceutical companies, etc. can collaborate in an effort to remedy public health crises related to undiagnosed and untreated ADHD/neurodiversity in adolescents and young adults potentially on negative trajectories.

Therapeutic Tolerance and Other Explanations for the Limited Long Term Impact of CNS Stimulant Treatment of ADHD

10:45 AM - 12:15 PM

Therapeutic Tolerance and Other Explanations for the Limited Long Term Impact of CNS Stimulant Treatment of ADHD

Chair: James Waxmonsky, Penn State College of Medicine

Presenters:

James Swanson, University of California - Irvine, UCI Child Development Center

William Pelham III, UC San Diego

Marcela Ramos, Center for Children and Families, Florida International University

James Waxmonsky, Penn State College of Medicine

Overall Abstract: There is a robust evidence-base for CNS stimulants improving functioning at school, home and in recreational settings. Despite large initial effects, many children with ADHD remain persistently impaired with benefits diminishing over time even with continuous treatment. A variety of explanations have been proposed for these limited long-term effects, including tolerance, a neural adaptation where medication results in decreasing effects over time. Alternative explanations include the possibility that medication has limited impact on key domains like academics that predict long-term success or that medication and behavioral treatments are typically not sequenced in a way that optimizes sustained gains. A recently completed NIH-funded project (MH099030) was the first study to prospectively examine the occurrence of tolerance to CNS stimulants and means to mitigate it. It also examined the impact of medication on specific domains of classroom functioning including learning new material, seatwork productivity and classroom behavior. Lastly, it assessed sequencing effects of medication and behavioral treatments on children's functioning in recreational settings.

This symposium will synthesize the literature on tolerance to CNS stimulants and present study findings for the acute and sustained impact of medication on multiple aspects of classroom functioning, the impact of medication on concurrent psychosocial interventions and the capacity of drug holidays for preventing tolerance with the goal of aiding attendees to critically analyze longitudinal outcomes and craft multimodal treatment plans optimizing acute response and sustaining benefit.

Participants included 237 children participating in a therapeutic summercamp with CNS stimulant dose optimized over 10 days. They were then randomized to two three-week cycles of optimal dose and placebo with classroom functioning assessed 2xday. When school commenced,

half were randomized to 7-day-a-week dosing and half to 5-day-a-week dosing. Participants were assessed monthly over the school year with dose increasing only when predetermined impairment thresholds were met.

Learning Objective 1: This symposium will synthesize the literature on tolerance to CNS stimulants and apply them to the clinical practice for managing ADHD.

Learning Objective 2: Participants will be able to analyze research findings on the acute and sustained effects of CNS stimulant medication on classroom functioning

Learning Objective 3: Participants will be able to use this knowledge to develop multimodal treatment plans that optimize acute response and sustain benefits

The Effect of Stimulant Medication on Learning of Academic Curricula in Children With ADHD

William Pelham III, UC San Diego

Hypothesis/Objective: Evaluate whether stimulant medication improves acquisition of academic material in children with attention deficit hyperactivity disorder (ADHD) receiving small-group, content-area instruction in a classroom setting.

Methods: Participants were 173 children between the ages of 7 and 12 (77% male, 86% Hispanic) who met DSM -5 criteria for ADHD and were participating in a therapeutic summer camp. The design was a triple-masked, within-subject, AB/BA crossover trial. Children completed two consecutive phases of daily, 25-minute instruction in both (a) subject-area content (science, social studies) and (b) vocabulary. Each phase was a standard instructional unit lasting for 3 weeks. Teachers and aides taught the material to small groups in a summer classroom setting. Each child was randomized to be medicated with daily osmotic-release oral system methylphenidate (OROS-MPH) during either the first or second of the instructional phases, receiving placebo during the other.

Results: Medication had large, salutary, statistically significant effects on children's academic seatwork productivity and classroom behavior on every single day of the instructional period. However, there was no detectable effect of medication on learning the material taught during instruction: children learned the same amount of subject-area and vocabulary content whether they were taking OROS-MPH or placebo during the instructional period.

Conclusions: Acute effects of OROS-MPH on daily academic seatwork productivity and classroom behavior did not translate into improved learning of new academic material taught via small-group, evidence-based instruction.

What We Know About the Emergence of Therapeutic Tolerance to CNS Stimulants for the Treatment of ADHD

James Swanson, University of California - Irvine, UCI Child Development Center

Hypothesis/Objective: Central Nervous System (CNS) stimulant medications are a well-established short-term treatment for childhood ADHD. However, the data to support their long term efficacy is less robust. One explanation that has been proposed for the reduced evidence of long term versus acute effects of CNS Stimulants is the development of tolerance to the therapeutic benefits of this medication class.

Methods: This presentation will review the extant literature on the emergence of therapeutic tolerance for CNS Stimulants as well as theorized mechanisms for it. In addition, this presentation will review findings from a recent NIH study (MH099030) designed to test for the emergence of therapeutic tolerance in school-aged children with ADHD prescribed CNS stimulants during a 3 week analog classroom experience.

Results: Results demonstrate that therapeutic effects of stimulant medication on academic productivity measured via a timed 10 minute math test and rule following behavior measured via direct observation in an analog classroom setting do not significantly dissipate over three weeks among most children with ADHD.

Conclusions: When measured using objective standards, the therapeutic effects on CNS stimulant medication for improving the functioning of children with ADHD does not appear to diminish over a period of weeks.

Reduced Efficacy of Behavior Therapy Following Initial Multimodal Treatment of ADHD

Marcela Ramos, Center for Children and Families, Florida International University

Hypothesis/Objective: Clinical guidelines disagree on whether to start treatment for children with ADHD with concurrent behavior therapy and medication ("combined treatment") or with behavior therapy alone, then add medication as necessary. We hypothesized that children who started with BT and then switched to COMB treatment would show lower rates of inappropriate behavior during the unmedicated (BT) condition compared to children who started with COMB treatment and then received BT alone. Relevant post hoc findings from a triple-blind, AB/BA crossover study conducted in the Summer Treatment Program (STP).

Methods: 248 children with ADHD were randomized to receive either (a) intensive behavior therapy plus medication ("BT+MED") or (b) intensive behavior therapy plus placebo ("BT") for 3 weeks, then cross over to the opposite condition for another 3 weeks. Behavior in recreational settings was systematically recorded and analyzed as a function of medication status and order of treatments.

Results: We found evidence that initial medication reduced the efficacy of subsequent behavior therapy. Children exhibited significantly more misbehaviors when unmedicated if they started with combined treatment, then had medication withdrawn, than if they started with BT alone. We did not find evidence that initial behavior therapy reduced the efficacy of subsequent medication. Children behaved similarly when medicated whether taking it in the first or second phase of the crossover design.

Conclusions: Findings support the clinical recommendation to start treatment of ADHD with behavior therapy, then add medication as necessary

Do Prescribed Drug Holidays in Children With ADHD Impact the Dose Trajectory of CNS Stimulants Over the Course of the School Year?

James Waxmonsky, Penn State College of Medicine

Hypothesis/Objective: There is substantive evidence that the dose of CNS stimulants used to treat ADHD in children progressively increases over the course of the school year, even when the dose is first systematically optimized (Vitiello 2001). If this pattern is at least partly due to therapeutic tolerance, then drug holidays may preserve initial effects. This NIH funded RCT was designed to examine if prescribed drug holidays reduce the need to adjust dose over the course of one school year.

Methods: 237 elementary-aged children (Mean age = 8.1, 77% male, 85% Hispanic, 69.6% previously medicated) were randomly assigned to receive extended-release methylphenidate (OROS-MPH) either on school days only or 7-days per week for the duration of the school year. Participants were assessed monthly with study clinicians increasing dose only when predetermined impairment thresholds were met. All ADHD medication was provided through the study.

Results: Dose significantly increased over the course of the school year (B=0.01, SE=0.01, p<.001). Greater baseline levels of internalizing (CBCL) comorbidity were associated with larger escalations in dose over time but age, gender and duration of prior stimulant use were not. There was a significant interaction between time and medication dosing pattern (B=0.01, SE=0.00, p = 0.012), such that the increase in dose over time was greater for those randomly assigned to continuous medication (mean daily dose over the year =1.012mg of MPH/kg) compared to those assigned to weekend holidays (mean daily dose over the year = .931mg of MPH/kg) group. Mean doses at the end of the study were 1.31 (.56)mg/kg/day for continuous dosing and 1.19 (.56) mg/kg/day for school day only dosing vs .7mg/kg/day at baseline.

Conclusions: Prescribed drug holidays were associated with more stable dosing patterns over the school year, possibly by impeding the onset of tolerance to therapeutic effects.

Fostering Equitable Access and Delivery of Parent Behavior Management Training for ADHD

10:45 AM - 12:15 PM

Fostering Equitable Access and Delivery of Parent Behavior Management Training for ADHD

Chair: Erin Gonzalez, University of Washington School of Medicine

Presenters:

John Mitchell, Duke University Medical Center

Nicole Groves, Seattle Children's Hospital

Nadia Bounoua, University of Maryland

Sara Chung, University of California, San Fransisco

Overall Abstract: As the frontline behavioral treatment for childhood ADHD, Behavioral Parent Training (BPT) reduces children's oppositional and disruptive behavior by improving caregivers' use of positive parenting strategies and consistent contingencies (Fabiano et al., 2015). Despite its robust outcomes, access to BPT is generally poor. Less than half of children with ADHD receive any treatment and only around a quarter receive outpatient behavioral treatment (Danielson et al., 2018). Rates of treatment access and engagement are lower for families speaking a language other than English or from disadvantaged or minority backgrounds (Chacko et al., 2016; Danielson et al., 2017). Although the disparities are well documented, key facilitators to recruitment, engagement and retention of diverse families in evidence-based BPT remains largely understudied (Slobodin & Masalha, 2020). Equitable access to BPT requires researchers to understand factors underlying disparities, develop culturally and linguistically-responsive BPT adaptations, and bring evidence-based BPT to accessible settings.

The current symposium explores disparities in BPT engagement and innovations to improve uptake and acceptability for families from underserved groups. First, Dr. Groves will share findings on differences in BPT family engagement and clinical outcomes for Black, Indigenous and Families of Color and learnings to increase equitable delivery in an outpatient care setting. Dr. Bounoua will then speak on results of a primary care-integrated BPT program adapted for parents with ADHD and how integrated delivery shapes access for racially and ethnically diverse caregivers. Next, Dr. Mitchell will share findings from the co-design of a Spanish language BPT program delivered in a community setting for Latine families. Finally, Dr. Chung will speak on engagement and skill use for Asian American parents participating in BPT in a school setting. The studies will inform further work to address barriers, adapt to accessible care settings, and create culturally-responsive BPT programs.

Learning Objective 1: Describe discrepancies in behavioral treatment availability and accessibility for BPIOC youth with ADHD.

Learning Objective 2: Identify drivers of disparities in engagement and outcomes of parent behavior management training for underrepresented families.

Learning Objective 3: Describe the key barriers to engagement in Behavioral Parent Training (BPT) for families from underserved and minority backgrounds, and develop strategies for enhancing the accessibility, cultural responsiveness, and effectiveness of BPT in diverse settings.

Behavioral Parent Training Via Telehealth for Multiplex ADHD Families in Pediatric Primary Care

Nadia Bounoua, University of Maryland

Hypothesis/Objective: To describe the implementation of an integrated parenting intervention (IPI-A) for caregivers with ADHD, as delivered via telehealth by psychologists embedded in urban pediatric primary care.

Methods: Parents and children were recruited via screening in urban pediatric offices, waitlists, provider referrals, and through media. Multiplex ADHD families were randomized (1:1) to receive a brief, flexible dose titration of Extended Release Mixed Amphetamine Salts and 10 sessions of behavioral parent training (BPT) tailored for parents with ADHD or BPT only. Ten, one-hour telehealth sessions were delivered with parenting content including behavior management strategies as well as a focus on organizational and cognitive-behavioral skills targeting parent mental health. Embedded psychologists were trained to implement this program with fidelity and participated in weekly supervision.

Results: Telehealth afforded many benefits when delivering this intervention with caregivers with ADHD, many of whom experience social disadvantage: 1) parents who did not log on could be called and were often able to join the session; 2) a second caregiver could attend from a different location; flexibility with scheduling/rescheduling (e.g., could attend during lunch hour at work, from parked car); 4) reduction of transportation burden/cost; 5) expanded reach, particularly with PSYPACT; 6) providing a "window" into the home environment and ability to coach in the moment; 7) reduced need for childcare. Challenges included: 1) device type and connectivity; 2) additional privacy considerations (e.g., in the home, parents joining call from public places); 3) home distractions/interruptions. Additionally, sessions included a great deal of content and one-hour sessions may be challenging to deliver within the typical workflow of integrated behavioral health providers.

Conclusions: Delivering integrated parenting interventions for caregivers with ADHD is feasible for psychologists integrated in pediatric clinics. Several benefits of telehealth have been noted, particularly when working with socially disadvantaged families; yet some challenges exist. Reduction of session content and length may be more feasible in primary care.

El Faro: Community Engaged Treatment Development and Pilot Trial of a Parent Behavior Management Training for Caregivers of Children With ADHD in Latine Families

John Mitchell, Duke University Medical Center

Hypothesis/Objective: There is a need for culturally-informed psychosocial treatment interventions for Latine families of children with attention-deficit/hyperactivity disorder (ADHD). The purpose of this study was to develop and pilot a Spanish language parent management training for caregivers of children with ADHD in Latine families—called El Faro—in a community setting.

Methods: A partnership was developed between a community-based organization that treats mental health in the Latine community (El Futuro) and an academic center (Duke University). Along with a caregiver advisory board (n = 6) , the partnership adapted and pilot tested a culturally-informed parent behavior management training for Latine families with children

diagnosed with ADHD: El Faro. A sample of 27 parents of children age 6-12 years-old with ADHD subsequently completed this adapted parent training in live, remote sessions in a community setting. Pre- and post-treatment assessments were completed to assess feasibility, acceptability, and within subjects change in outcomes.

Results: The caregiver advisory board met four times. In collaboration with the community-academic partnership, an 8-session El Faro treatment manual, a booklet for parents (called El Cuaderno) to accompany those participating in El Faro, a template of weekly messages to parents participating in El Faro, and video messages were created. For the pilot trial, caregivers attended an average of 80% of sessions (M = 6.41 out of 8 sessions, SD = 1.60). Clinician-rated homework completion on a scale of 1 to 5 (5 indicated highest score for homework completion) yielded an average score of 3.36 (SD = 1.07), indicating that parents on average utilized El Faro materials regularly. Caregiver overall satisfaction was 6.78 (SD = 0.51) on a scale of 1 to 7 (7 indicated highest satisfaction rating). Additional items assessing El Faro acceptability on a scale of 1 to 4 (4 indicated the highest satisfaction rating) ranged from a mean score of 3.52 to 3.93 (SDs ranged from 0.26 to 0.75). Pre- and post-treatment change scores yielded medium to large effect sizes for caregiver-reported child inattentive and hyperactive-impulsive ADHD symptoms and total functional impairment score (all p's $\leq$ .002). Parenting sense of competence scores and teacher-rated child ADHD symptoms (for a subsample) did not change.

Conclusions: Building on a caregiver advisory board and community-academic partnership collaboration, El Faro as an intervention for Latine families of children with ADHD was feasible and acceptable in a community-setting. Within subject changes in ADHD symptoms and related functional impairment also improved. Future studies are needed to further refine and test the effectiveness of this intervention in real-world, community settings against an active treatment comparison condition.

A Mixed-Method Comparison of Treatment Outcomes and Engagement With Parent Training for White and BIPOC Caregivers

Nicole Groves, Seattle Children's Hospital

Hypothesis/Objective: Parent Behavior Management Training (PBMT) is the first-line psychosocial intervention for pediatric ADHD and related disorders. Extant research documents disparities in PBMT engagement and treatment-related improvements for BIPOC children and families relative to their White counterparts. This study investigated quantitative differences in treatment engagement, satisfaction, and clinical outcomes as well as qualitative feedback for White and BIPOC caregivers who participated in a telehealth PBMT group.

Methods: Data from 177 caregivers (138 white, 39 BIPOC) were collected as a part of routine clinical care before and after participating in a 9-week telehealth PBMT group. Measures included caregiver-reported child ADHD and oppositional/defiant symptoms, child functional impairment, and parenting behaviors. Caregivers also provided satisfaction ratings and free responses feedback about the most and least helpful aspects of group and suggestions for improvement and inclusivity at post-treatment.

Results: White caregivers attended significantly more sessions (8.28 ± 1.19) than BIPOC caregivers (7.79 ± 1.36). Controlling for attendance, only White caregivers reported significant reductions in inattentive (d=0.78) and hyperactive/impulsive symptoms (d=0.78). White and BIPOC caregivers reported significant reductions in children's oppositional/defiant symptoms (d=0.78, 0.40) and functional impairment (d=0.82, 0.34). White caregivers reported decreased use of inconsistent discipline (d=0.72). Overall satisfaction was high and did not differ across groups. Themes in qualitative data generally did not differ between White and BIPOC caregivers. Specific behavior management skills and discussions/support were the most reported helpful aspects of group. Themes related to specific PBMT content, timing (pace of group, scheduling), and other logistic barriers to participation were the most frequently reported unhelpful aspects/suggested improvements for group.

Conclusions: BIPOC and White caregivers report clinical improvements related to PBMT, but there are still crucial disparities in some treatment outcomes and barriers to engagement. Incorporating caregivers' feedback may increase access to equitable care for children with ADHD.

Asian American Parent Engagement in and Adherence to School-Based BPT

Sara Chung, University of California, San Fransisco

Hypothesis/Objective: Asian Americans (AA) face significant disparities in ADHD diagnosis and treatment. Compared to non-Hispanic white (NHW) families, AA children were 46% less likely to receive ADHD treatment and AA parents in behavioral treatments have shown lower engagement and reported less child improvement. Schools are a key setting to engage underrepresented families but evidence in this setting is scant. This study examined AA parent engagement in school-based behavioral parent training (BPT). We hypothesized that compared to NHWs, AA parents will have: (a) lower engagement and attendance, and (b) lower adherence to three skills: praise, ignoring misbehavior, and encouraging accepting.

Methods: School mental health providers delivered two trials of an 8-week BPT intervention to parents (N = 78, AA n = 33, NHW n = 36, other/not reported = 9) of identified 2nd to 5th grade students (M age = 8.63, SD = 1.45). Parents reported on (a) weekly ratings on in-session engagement and between-session skill adherence (5 items), and (b) adherence to praise, ignoring, and encouraging accepting (3 items) at post-treatment. Engagement scores were an aggregate of the 5 weekly items across sessions attended.

Results: The sample comprised a higher proportion of AA participants than those reported in similar trials in other settings. Linear models showed similar engagement for AA and NHW parents (respective medians = 3.29 & 3.44; B = -.09, p = .52) and attendance (B = -.32, p = .22). Parent education positively predicted engagement and attendance (respective Bs = .29 & .61, ps = .005 & .001). Ordinal logistic regressions indicated that, compared to NHWs, AA parents were respectively 2.5 and 2.6 times more likely to endorse higher use of ignoring ($\chi2 = 3.80$, df = 1, p = .05) and encouraging accepting ($\chi2 = 4.15$, df = 1, p = .04).

Conclusions: AA parents had similar engagement and attendance to NHW parents in school-based BPT. These findings indicate the promise of school mental health services for engaging AA families in ADHD treatment. These findings also suggest racial/ethnic differences in some parent responses to BPT. Study limitations include the small sample size and restricted cultural heterogeneity. Future research with a larger sample should explore the effects of acculturation, language ability, and ethnic heterogeneity on BPT engagement.

Spotlight on ADHD: Addressing the Need for Diagnosis and Treatment of Girls and Women

12:15PM – 1:15PM

Poster Data Blitz

1:30 PM – 2:30PM

Chair: Anne Arnett, Boston Children's Hospital

Presenters:

Douglas Leffa, University of Pittsburgh Medical Center

Sooyun Cho – Florida State University

Marija Pranjic, Boston Children's Hospital, Harvard Medical School

Zeina Kamar Eddine – City College of New York

Cathrin Green, Cincinnati Children's Hospital Medical Center

Elijah Bautista

Alex Greenberg – University of Alabama

Navi Ram – University of Toronto & SickKids

Rachel Northrup – Kennedy Krieger Institute

Genetic Risk for ADHD potentiates the Detrimental Effects of Amyloid in Individuals with Mild Cognitive Decline

Douglas Leffa, University of Pittsburgh Medical Center

Hypothesis/Objective: Prior evidence suggests that the genetic risk for ADHD increases susceptibility to the harmful effects of amyloid-β (Aβ) pathology and is associated with increased risk for Alzheimer's disease (AD). However, the combined effects of ADHD and Aβ in individuals with mild cognitive impairment (MCI) is unknown. In this study, we tested the hypothesis that the genetic risk for ADHD interacts with Aβ leading to worse cognitive function and elevated markers of AD pathology in MCI.

Methods: We computed weighted ADHD polygenic risk scores (ADHD-PRS) in 501 individuals with MCI (mean age 72.3 [SD 7.3] years) with genomic information, clinical

assessments, and CSF analysis for Aβ and phosphorylated tau. A subset underwent fluorodeoxyglucose positron emission tomography ([18F]FDG PET). Using regression models, we examined the interaction between ADHD-PRS and Aβ on cognition and AD biomarkers.

Results: We observed significant interactions between ADHD-PRS and Aβ, indicating that ADHD-PRS was associated with worse cognitive function and higher levels of CSF tau pathology only in Aβ-positive individuals. Additionally, increased ADHD-PRS was associated with hypometabolism across widespread cortical and subcortical regions among Aβ-positive participants.

Conclusions: In MCI, ADHD potentiated the detrimental effects of Aβ pathology leading to worse cognitive function, higher tau pathology, and brain hypometabolism. Our results suggest that genetic liability for ADHD increases susceptibility to the harmful effects of Aβ pathology in individuals with MCI.

Skills Acquisition vs. Performance Deficits: Why do Children with ADHD Exhibit Social Problems?

Sooyun Cho – Florida State University

Hypothesis/Objective: There is a growing understanding that the social problems exhibited by children with ADHD reflect inconsistent performance of learned skills rather than a knowledge gap (Aduen et al., 2018; de Boo & Prins, 2007), but prior work has been primarily theoretical and/or based on relatively small samples. The current study provides the largest investigation to date and builds on prior work by examining the extent to which ADHD-related knowledge acquisition vs. skill performance deficits differ across specific social skill domains

Methods: Social Skills Improvement System (SSIS; Gresham et al., 2010) was administered to parents and teachers for a sample of 277 clinically-evaluated and carefully-phenotyped children aged 8 to 13 years (M = 10.3, SD = 1.40, 78 girls) from the Southeastern U.S. Participants included 191 children with ADHD and 86 children without ADHD (non-ADHD group). The SSIS measures 7 specific social skill domains (Communication, Cooperation, Assertion, Responsibility, Empathy, Engagement, and Self-Control). acquisition deficits and performance deficits were identified for each social skill domain, separately for parents and teachers, using the Gresham et al. (2010) social behavioral analysis of each informant's item-level endorsements. Negative-binomial generalized linear models were conducted given evidence of zero-inflation, separately for acquisition and performance deficits, with informant (parent, teacher) and social skill domain (listed above) as within-subjects factors, group (ADHD, non-ADHD) as the between-subjects factor, and covariates (age, SES, sex), using Jamovi v. 2.3 (The jamovi project, 2023) and R package 'performance' (Lüdecke et al., 2021).

Results: When compared to the non-ADHD group, children with ADHD were more likely to be perceived by parents and teachers as missing important social knowledge (acquisition deficits) in the domains of communication ($p = .002$), cooperation ($p < .001$), responsibility ($p < .001$), and self-control ($p < .001$). Despite these differences, acquisition deficits in ADHD were relatively rare: There were no specific (item level) social skills that parents and teachers agreed were

missing in at least 15% of children with ADHD, although teachers endorsed that a subset (25-32%) of children in the ADHD group were missing skills related to not bothering others and asking help from adults.

In contrast, performance deficits among children with ADHD were more prevalent. The omnibus model indicated that children with ADHD exhibit higher rates of inconsistent performance in terms of communication ($p < .001$), cooperation ($p < .001$), empathy ($p < .001$), responsibility ($p < .001$), and self-control ($p < .001$). There was broad agreement between parents and teachers that the majority (>50%) of children with ADHD have difficulty consistently implementing the skills they know with regard to attending to instructions and following directions. Parents but not teachers also reported that 50%+ of the ADHD group exhibit performance deficits in staying calm when teased/criticized/disagreeing, compromising with others, taking responsibility, and not bothering others. Teachers but not parents reported performance deficits at this frequency only for following classroom rules.

Conclusions: The results provide the strongest evidence to date suggesting that social problems in children with ADHD primarily reflect consistently inconsistent performance of known social skills, rather than these children not knowing how to skillfully engage socially. While acquisition deficits occurred at higher rates for children with ADHD than their peers, they were rare and idiosyncratic, suggesting that ADHD does not confer significant risk for failure to learn any specific social skill.

Performance deficits, on the other hand, were more pronounced and were observed across home and school settings by different informants. There was broad agreement by parents and teachers that children with ADHD know these skills, but have difficulty implementing them consistently. These findings may explain the inefficacy of traditional social skills training for ADHD that focused on teaching and practicing skills in clinic settings (de Boo & Prins, 2007; Mikami et al., 2013). Instead, the findings support development and testing of newer programs that emphasize spontaneous, in-vivo intervention rather than simple social skills memorization (Mikami et al., 2022).

Movement-Related Cortical Potentials Underlying Motor Preparation and Execution in Children with Attention-Deficit/Hyperactivity Disorder

Marija Pranjic, Boston Children's Hospital, Harvard Medical School

Hypothesis/Objective: Approximately 50% of children with attention-deficit/hyperactivity disorder (ADHD) also display motor difficulties that are consistent with developmental coordination disorder (DCD). Although coexisting ADHD+DCD symptomatology is associated with greater functional impairment than either disorder alone, it is not well understood whether ADHD and DCD have shared or separate etiologies. In particular, it remains unknown whether motor difficulties occur during movement preparation, execution, or both.

Methods: Sixty-six children with ADHD and 30 typically developing (TD) children (7–11 years) completed event-related potential (ERP) recordings and neuropsychological testing, including a visual-motor integration (Beery VMI) test. Movement-related cortical potentials

(MRCPs) were extracted during two ERP tasks. We tested (1) whether children with ADHD have atypical MRCPs during movement preparation and/or execution, and (2) whether MRCPs related to VMI performance and ADHD diagnosis are separate or shared.

Results: In both ERP tasks, children with ADHD were significantly less accurate and displayed attenuated correct trial MRCP amplitudes at a fronto-midline electrode during movement preparation but not execution. Greater ADHD symptom severity was associated with reduced VMI scores, over and above age and IQ. ADHD diagnosis and reduced error trial MRCPs each explained unique variance in VMI performance. In contrast, attenuated correct trial MRCPs were associated with ADHD diagnosis.

Conclusions: Compared to TDs, children with ADHD display atypical MRCPs during movement preparation but not execution. Additionally, distinct cortical processes are linked with VMI performance and ADHD diagnosis, providing support for the separate etiology hypothesis. Comorbidity between ADHD and DCD is likely due to a combination of behavioral and neurobiological vulnerabilities.

Ethnically and Racially Minoritized College Students' Beliefs and Understanding about ADHD following Group CBT Intervention: A Qualitative Study

Zeina Kamar Eddine – City College of New York

Hypothesis/Objective: This qualitative study investigated: (i) personal, familial and cultural beliefs surrounding ADHD, (ii) how these beliefs have impacted access to services and self-concept, and (iii) whether students' understanding and beliefs about ADHD changed after completing a group cognitive-behavioral intervention (CBT) targeting executive dysfunction.

Methods: N=26 minoritized (35% Latine; 73% BIPOC) college students [Mean (SD) age = 21.83 (2.64) years; 81% female], who met DSM-5 criteria for ADHD-I/C, completed a 12-week group CBT intervention targeting executive functioning skills. At treatment conclusion, students completed a 45-60 minute one-on-one qualitative interview. The study employed Interpretative Phenomenological Analysis to identify major themes.

Results: Themes included: (i) ADHD and mental illness are often stigmatized and associated behaviors explained as characterological weaknesses or a privilege of other racial groups; (ii) difficulty talking about ADHD and mental health with parents exacerbate difficulties; (iii) individuals often inadvertently learned about ADHD as young adults via social media; (iv) younger people show greater acceptance of ADHD than older generations; (v) ADHD messaging may be more effective if delivered by respected community figures; (vi) participants expressed a desire to reassure their younger selves of their worth; (vii) participants found solace in connecting with others who have ADHD; (viii) the intervention increased ADHD acceptance and provided hope that students could learn skills to reduce impairment.

Conclusions: Conclusions and Implications. Findings highlight the loneliness, negative attributions and misinformation experienced by minoritized college students with ADHD, which group treatment may help ameliorate. Findings inform supports for students with ADHD within higher education settings.

The Role of Extracurricular Participation in Relation to Psychological Well-being and Social Functioning in Adolescents with ADHD

Cathrin Green, Cincinnati Children's Hospital Medical Center

Hypothesis/Objective: ADHD can have significant adverse effects on mental health, peer relationships, social skills, and overall well-being. Given these challenges, it is essential to explore protective factors that support youth with ADHD. One such factor is participation in extracurricular activities, which includes both structured and unstructured activities that adolescents engage in before, during, or after school. These activities play a critical role in promoting mental health and well-being. Although prior research has demonstrated that extracurricular participation fosters desirable outcomes (e.g., increasing high school graduation rate, decreasing delinquent behavior), there has been limited attention to its relationship with indicators of positive youth development. Moreover, very few studies have examined the role of extracurricular activities in relation to the well-being and functioning of adolescents with ADHD. This study aims to examine the relationship between frequency of extracurricular participation and youth well-being, social adaptive behavior, and internalizing symptoms in a racially diverse group of adolescents with ADHD. Additionally, it will explore how specific types of extracurricular activities differentially relate to these outcomes.

Methods: This study utilizes data from the sixth wave of the Future of Families and Child Wellbeing Study (FFCWS). Participants included 588 adolescents (14-18 years old at time of interview; Mage = 15.61) with a previous diagnosis of ADHD (72.4% male; 48% Black, 24.1% White, 19.4% Latino/a/e).

Results: Above and beyond race, sex, and caregiver-reported overall global impairment, regression analyses showed that more frequent participation in adolescent-reported extracurricular activities predicted higher self-reported youth well-being ($\beta = .132$, $p < .05$) and higher self-reported socially adaptive behavior ($\beta = .222$, $p < .001$). Participation in extracurricular activities did not predict self-reported internalizing symptomatology. Next, follow-up path analyses were conducted to explore the differential impact of extracurricular type. Participation in volunteer activities predicted higher well-being ($\beta = .147$, $p < .05$) and socially adaptive behavior ($\beta = .201$, $p < .001$). Participation in religious services also predicted higher socially adaptive behavior ($\beta = .099$, $p < .05$). Interestingly, participation in school activities predicted higher self-reported depressive symptoms ($\beta = .109$, $p < .05$) but lower anxiety symptoms ($\beta = -.123$, $p < .05$).

Conclusions: The findings suggest that increased participation in extracurricular activities enhances well-being and social functioning, even when accounting for the global impairment linked to an ADHD diagnosis. However, it's notable that the frequency and type of extracurricular activities did not protect against mood symptoms. Future research should explore the mechanisms through which extracurricular involvement promotes well-being in the context of ADHD-related risks. Additionally, longitudinal studies are essential to understanding the long-term effects of extracurricular participation on outcomes.

The Association Between Grit and Emotional Regulation Among Adults with ADHD

Elijah Bautista

Hypothesis/Objective: Existing literature suggests that individuals with ADHD tend to have lower levels of grit, defined as perseverance and sustained passion toward achieving a goal. Furthermore, emotional dysregulation–the inability to manage or flexibly respond to emotional states– is a key feature of ADHD. It may be possible that individuals who exhibit stronger grit are more effective regulators of emotion, however, current research has shown conflicting results. The current study seeks to investigate the association between grit and emotional regulation (ER) in adults diagnosed with ADHD and explore whether the relationship varies by gender. We hypothesize that those with higher self-reported grit will exhibit higher scores in ER.

Methods: Adult participants diagnosed with ADHD (N=70) aged 18-50 (30.5±7.2 years) participated in structured clinical interviews and assessments. Assessments included the Grit scale and subscales of the Styles of Emotion Regulation Questionnaire: cognitive reappraisal (CR) and emotion suppression (ES). Self-report data were analyzed using Pearson correlations.

Results: Consistent with our hypothesis, we found that grit was correlated with ER. Grit was positively correlated with CR ($r = .273$, $p = .018$) and negatively correlated with ES ($r = -.232$, $p = .046$). When examining this relation by gender, the correlation between grit and ES was only found in females ($r = -.381$, $p = .017$). In other words, female adults with ADHD who had higher grit had lower ES.

Conclusions: These results suggest that effective emotional regulation can enhance perseverance through challenges and setbacks, underscoring the potential benefits of emotional regulation interventions for individuals with ADHD.

Co-Occurring ADHD and Anxiety in Youth: Links with Social Functioning in an Icelandic Sample

Alex Greenberg – University of Alabama

Hypothesis/Objective: Youth with ADHD commonly experience social functioning deficits. ADHD and anxiety often co-occur, which may lead to greater social impairment. Research on the co-occurrence of ADHD and anxiety and its impact on social impairment has largely been mixed and limited to research based in the United States. The current study examines ADHD, anxiety, and social impairment in an Icelandic sample.

Methods: The current sample consists of 1,849 children (aged 7-10 years) referred to a psychological clinic in Iceland. Social difficulty was assessed via multiple informants, using the Autism Spectrum Screening Questionnaire (ASSQ). Factor 1 of the ASSQ features items related to social deficits. Four groups were defined: ADHD ($n = 865$), Anxiety ($n = 172$), and ADHD + Anxiety ($n = 168$), and Control ($n = 644$).

Results: One-way ANOVAs were conducted to examine social difficulty differences across groups. The overall ANOVAs were significant ($ps<.05$). Father and teacher reports revealed no significant differences across groups of interest. Mothers reported significantly greater social difficulties for ADHD + Anxiety ($M=7.58$), ADHD ($M=6.34$), and Anxiety ($M=5.62$) relative to

Control (M=4.57) groups. ADHD + Anxiety had significantly greater social difficulties than the Anxiety and ADHD groups (ps < .05).

Conclusions: Mothers reported greater social difficulties for ADHD + Anxiety relative to ADHD. Mothers may be better attuned to the social difficulties in their children relative to teachers and fathers, but additional research is needed to assess. Clinicians working with ADHD + anxiety youth should assess for and consider social difficulties as an intervention target.

Examining Heterogeneity in Response to MegaTeam Executive Functioning Training in ADHD Children

Navi Ram – University of Toronto & SickKids

Hypothesis/Objective: MegaTeam is a videogame-based executive functioning (EF) training program co-designed with youth patient-partners. The current study explored primary intervention outcomes and heterogeneity of treatment response on near-transfer and far-transfer outcomes in children with ADHD.

Methods: 186 participants with ADHD ages 6-12 were randomized to MegaTeam EF training (5 weeks) or treatment-as-usual. EFs were measured at baseline, post treatment, and 6 month follow-up. Outcomes included near-transfer effects on inhibitory control (Stop Task) and working memory (N-Back) and far-transfer effects on ADHD traits (Swanson, Nolan, and Pelham: SNAP), EF impairment (Behavior Rating Inventory of Executive Function: BRIEF-2), planning (Tower Task), and academic fluency (Woodcock-Johnson III). Baseline EF, clinical, and performance characteristics will be examined as predictors and moderators of response to treatment.

Results: At 6 months the MegaTeam group showed significant near-transfer treatment effects in inhibition ($d = -0.58$, $p < 0.05$), working memory ($d = 0.23$, $p < 0.05$) and far transfer effects on ADHD symptoms via the SNAP ($d = -0.59$, $p < 0.05$) and EF impairment via the BRIEF-2 ($d = -0.50$, $p < 0.05$). Planning and academic fluency did not significantly improve. Additional findings regarding heterogeneity of response will be available at the time of presentation.

Conclusions: MegaTeam significantly improved inhibition, working memory, ADHD traits, and EF-related impairment at 6 months indicating the potential of MegaTeam as an affordable and engaging intervention for ADHD. Identification of individual factors associated with heterogeneity of treatment response has the potential to improve efficiency in treatment administration for children and youth with EF deficits.

The Impact of Iron Supplementation on Restless Leg Symptoms in Children with ADHD

Rachel Northrup – Kennedy Krieger Institute

Hypothesis/Objective: ADHD and Restless Leg Syndrome (RLS) often co-occur in children, with up to 44% of children with ADHD exhibiting symptoms of RLS. Iron deficiency has been implicated as an underlying pathophysiological mechanism of both ADHD and RLS in children. While studies have assessed sleep in children with ADHD through actigraphy, few studies have investigated iron supplementation as a treatment for restless sleep in these children. The goal of

this pilot study is to assess changes in RLS symptoms over time based on iron supplementation treatment using both self-report and actigraphy measures.

Methods: Nine children (7 female) ages 11 to 16 (Mage=13.48) with ADHD and restlessness during sleep completed three months of oral iron supplementation treatment. Pre- and post-treatment, children completed a modified International Restless Leg Syndrome Rating Scale (IRLSS) and five nights of ankle actigraphy monitoring at home during sleep.

Results: There was a significant improvement with treatment in overall restlessness on the self-report IRLSS ($t(8)=1.890$, $p=.048$). Additionally, there were marginally significant improvements in number of arousals during sleep ($t(8)=1.710$, $p=.063$) as well as periodic limb movements of sleep (PLMS) associated with arousals ($t(8)=1.826$, $p=.053$), measured by actigraphy.

Conclusions: This study is the first of its kind to utilize ankle-monitor actigraphy to measure symptoms of RLS in children with ADHD, pre- and post- iron supplementation treatment. Findings from this study suggest that iron supplementation has the potential to improve RLS symptoms in children with ADHD; however, better powered studies are warranted.

Exhibitor Spotlight Session: Collegium Pharmaceutical

1:30PM – 2:30PM

Issues in ADHD on College Campuses

02:30 PM - 04:00 PM

Issues in ADHD on College Campuses

Chair: John Mitchell, Duke University Medical Center

Presenters:

Kevin Antshel, Syracuse University

Niki Elliot, University of San Diego

Michael Meinzer, University of Illinois at Chicago

Overall Abstract: Young adults with ADHD are at-risk for a number of negative outcomes during college compared to their peers without ADHD, such as poorer academic performance, emotional and social difficulties, and psychiatric comorbidity. Support for this group is crucial to minimize these negative effects, which starts with evidence-based assessment of ADHD, and extends to seeking, obtaining, and implementing accommodations, as well as other treatment services. However, for many college students with ADHD this can be a challenge because it is occurring at a time in life when external supports present earlier in development are likely to be less prominent, while at the same time academic and social demands increase. In addition, while minimizing the negative effects of ADHD via coping mechanisms among college students is important, it is also important for educators, clinicians, researchers, and administrators involved at the policy level to consider factors that can help college students with ADHD thrive in college.

This presentation will begin with a talk by Dr. Antshel on best practices in assessing and supporting college students with ADHD, followed by a panel discussion with Dr. Elliot, Dr. Meinzer, and Dr. Antshel on how to support college students with ADHD.

Learning Objective 1: The participant shall be able to articulate best practice approach to assessment of ADHD among college students.

Learning Objective 2: The participant shall be able to identify difficulties college students with ADHD face throughout their schooling.

Learning Objective 3: The participant shall be able to name university-level considerations and perspectives on how to help students with ADHD navigate college successfully.

Best Practices in Assessing and Supporting College Students With ADHD

Kevin Antshel, Syracuse University

Hypothesis/Objective: Best practices for working with college students with ADHD individually and university-level considerations and perspectives on how to help students navigate college successfully will be reviewed.

Methods: This presentation will focus on the practical aspects that are specific to assessing and supporting college students with ADHD. Assessment considerations specific to college students include the DSM-5 criteria and symptoms for college students, late-identified ADHD, sociodemographic variables which might explain late-identified status, understanding why a college student may seek out an ADHD assessment, self- and other-report of ADHD symptoms, considering impairment and assessing for and ruling out alternative explanations for ADHD-like symptoms including malingering. Support considerations specific to college students include the distinct documentation needs of college students with ADHD, testing accommodations, coaching, cognitive behavioral therapy, reducing reliance upon parents, improving emotion regulation, reducing stimulant diversion, and supporting medication adherence.

Results: There are many possible explanations for why a student may present for an ADHD assessment during college (e.g., need for updated documentation, previously limited service access and availability, diagnostic overshadowing, high intelligence, strong parental scaffolding, etc.). Supports for college students with ADHD ideally should be multi-faceted and include disability office supports such as testing accommodations and tutoring, group/individual cognitive behavioral therapy, peer-mediated supports, psychopharmacological supports and coaching.

Conclusions: The unique developmental stage of emerging adulthood and the college environment influence assessment and support considerations for ADHD in college students. This presentation aims to provide clinicians with practical strategies and considerations for working with college students with ADHD.

Panelist

Niki Elliot, University of San Diego

Description: Dr. Niki Elliott specializes in exploring the mind-body connection for neurodivergent learners, especially those with an ADHD diagnosis. She will share evidence-based practices that help educators create neuroinclusive learning environments that meet students' needs in elementary through post-secondary education.

Panelist

Michael Meinzer, University of Illinois at Chicago

Applying the Prevention Paradox to the ADHD Field: Public Health Implications

02:30 PM - 04:00 PM

Applying the Prevention Paradox to the ADHD Field: Public Health Implications

Chair: Margaret Sibley, University of Washington

Presenters:

David Coghill, University of Melbourne

James Swanson, University of California - Irvine, UCI Child Development Center

Margaret Sibley, University of Washington

Overall Abstract: This symposium showcases a debate between Dr. David Coghill and Dr. James Swanson on the topic of ADHD Prevention Strategies. Dr. Coghill will discuss the possibility of universal ADHD interventions in the digital age (see Coghill, 2020) and will situate this proposal within Rose's (1992) public health framework. He will identified challenges associated with evaluation of impact of primary, secondary, and tertiary prevention programs. Dr. Swanson proposes that Dr. Coghill he did not consider a recognized and critical limitation of Rose's approach (Charlton, 2015) that may apply to ADHD (i.e., the "risk function" is not uniform and treatment with medication alters this distribution). This is manifested as a Treatment x Severity interaction in population-based observational studies (Owens, 2021) and in prospective follow-up studies of RCTs that evaluate the temporal course of ADHD severity (Schacter et a;, 2005 and Swanson et al., 2006). Dr. Swanson will also introduce additional examples of mathematical principles that explain paradoxes in ADHD research findings (such as in the ABCD study, the MTA study), and will suggest updates to our field's methodology to ensure that false positive findings are minimized in ADHD prevention and intervention research. Dr. Sibley will chair this symposium and will serve as a moderator of the debate and Q&A between Dr. Coghill and Dr. Swanson.

Learning Objective 1: Identify mathematical principles that influence interpretation of ADHD prevention and intervention research findings.

Learning Objective 2: Discuss universal prevention strategies for ADHD within Rose's (1992) public health framework.

Learning Objective 3: Consider well-known clinical and statistical paradoxes that may apply to diagnosis and treatment of ADHD.

Evaluating Universal Interventions for ADHD: Getting It Right

David Coghill, University of Melbourne

Hypothesis/Objective: The main objective of the proposed symposium is to define some incontrovertible mathematical principles that apply to diagnosis and treatment of ADHD, which may identify some enduring unmet needs that undermine long-term prognosis of ADHD.

Methods: A description and discussion will be presented of the prevention paradox (Rose, 1994) and the variance explained fallacy (Abelson, 1985), which address issues regarding feasibility of applying universal interventions for ADHD. The classic summary of the prevention paradox (see Rose, 1994 and Rose, Khaw, and Marmot, 2009) can be modified to state "A preventive measure or universal intervention that brings large benefits to the community may offer little to each participating individual", and the converse may be stated as "The identification and treatment of a high-risk group that is beneficial to the individuals in the subgroup may not provide large benefit to the overall group". A summary of the variance explained fallacy provided by Abelson (1979) states "The attitude toward explained variance ought to be conditional on the degree to which the effects of the explanatory factor cumulate in practice", which justifies the pithy title of this article ("When a Little is a Lot").

Results: The literature provided troublesome findings from non-ADHD areas that will be considered to provide advice for the ADHD field. Recent meta-analyses of the effects of randomized clinical trials of several universal interventions suggest effects are small and non-significant [e.g., for mindfulness-based programs (Dunning et al., 2022) and school-based interventions to prevent depression and anxiety in children (Caldwell et al., 2019)]. Early education programs evaluated by lottery-based designs have produced null and negative findings (Burchinal et al., 2024), and funding sources have noted population health research studies must be powered to detect very small effects (Matthay et l., 2021).

Conclusions: In this context, there is only one way forward for evaluation of universal intervention programs for ADHD: large, high-quality randomised trials examining effects of universal prevention are needed, which are designed, conducted, and analysed with extreme caution to make sure that there are no methodological errors that could affect or bias the real-world outcomes of this type of study.

Paradoxes and Fallacies That Apply to Diagnosis and Treatment of ADHD

James Swanson, University of California - Irvine, UCI Child Development Center

Hypothesis/Objective: The main objective of the proposed symposium is to define some incontrovertible mathematical principles that apply to diagnosis and treatment of ADHD, which may identify some enduring unmet needs that undermine long-term prognosis of ADHD.

Methods: Some well-known "paradoxes and fallacies" apply to ADHD diagnostic surveys (e.g., the National Survey of Children's Health/NSCH), cohort studies (e.g., the Adolescent Brain and Cognitive Development/ABCD study), and treatment trials (e.g., the Multimodal Treatment of ADHD/MTA study). Discussion of this may provide insights regarding some troublesome

findings in the current literature. Prime examples are the base-rate fallacy (Kahneman and Tversky, 1985), the prevention paradox (Rose, 1994), the ecological fallacy (Robinson, 1950), and the initial value paradox (Wilder, 1967).

Results: The classic base-rate fallacy applies to categorical diagnosis of ADHD (with an assumed epidemiologic prevalence around 4-6% based on DSM-5 criteria). A common summary (see Wikipedia, 2024) states: "If the false-positive rate of a diagnostic method is higher than the true prevalence of a disorder, then the application of the method will identify more non-cases than bona fide cases". This occurred in the NSCH the ABCD study, which will be described and discussed. The classic prevention paradox applies to the treatment of ADHD cases (with an assumed response rate around 70% for short-term benefit). A classic summary (see Rose et al., 2009) states: "A preventive measure [or universal intervention] that brings large benefits to the community may offer little to each participating individual". The converse may hold, also: identification and treatment of a high-risk group that is beneficial to individuals in the subgroup may not provide large benefit to the group. This occurred in the MTA and other studies, with severity mediating response to treatment with medication, which will be described and discussed.

Conclusions: In recent national studies, troublesome findings were reported (e.g., the administrative prevalence was about twice the assumed epidemiologic prevalence, and more non-cases than bona fide cases were being treated with medication). These and other troublesome findings will be discussed and interpreted in light of predictions of classic paradoxes and fallacies, and modifications of current methods will be suggested.

Moderator

Margaret Sibley, University of Washington

Description: Dr. Sibley will moderate the debate between Dr. Coghill and Dr. Swanson. Moderating will include introducing the two debate participants, moderating the debate, and leading the Q&A session. Public health implications will be discussed as a part of the summary of the debate and the open discussion with the audience.

New Directions for Psychosocial ADHD Treatment

2:30 PM – 4:00 PM

New Directions for Psychosocial ADHD Treatment

Chair: Tycho Dekkers, Accare Child Study Center, University of Groningen, the Netherlands

Presenters:

Steven Evans, Ohio University

Saskia Van der Oord, KU Leuven

Tycho Dekkers, Accare Child Study Center, University of Groningen, the Netherlands

Overall Abstract: Psychosocial interventions for children and adolescents with ADHD are recommended by all clinical guidelines but their efficacy as well as their uptake can be

improved. In this symposium, four ADHD intervention-researchers from across the world will update the audience about new directions in their field, all aiming to increase efficacy and uptake of psychosocial ADHD interventions. In the first talk, Dr. Evans will present two studies showing the role of social impairment in the development of depression in adolescents with ADHD, thereby emphasizing the importance of targeting social impairment. He will then present an intervention study showing the promise of this approach, as moderate to large gains in social functioning for adolescents with ADHD were found. In the second talk, Dr. Tripp will speak about an important topic that is often overlooked while interpreting findings of intervention studies: whether findings actually reflect clinically reliable change. She will do so by presenting a large randomized controlled trial on behavioral parent training for children with ADHD in Japan. Third, Dr. Van der Oord will then speak about a new direction to improve parent training for children with ADHD, by focusing on the crucial role of attachment. Her work shows that children's attachment representations moderate the efficacy of different parent training techniques, which may be a promising avenue to better personalize interventions in the future. Finally, Dr. Dekkers will speak about ways to increase the uptake of context-focused interventions, such as behavioral parent training. He will show that a newly developed brief and personalized parent training program yields promising effects, which has the potential to remove barriers for parents. In addition, he will present new work on decontextualization, which is the phenomenon that context-focused interventions may not be implemented optimally because our current narrative on ADHD is too focused on the individual child, instead of its interaction with the context. Together, this symposium will provide new directions for psychosocial ADHD treatment. It provides new areas of focus, such as social impairment and attachment, will emphasize new techniques to analyze and interpret findings, and highlight the importance of uptake of effective psychosocial interventions.

Learning Objective 1: The participant will be able to incorporate new areas of focus within their research or clinical practice with regard to psychosocial ADHD treatment.

Learning Objective 2: The participant will be able to assess whether research findings have clinical significance.

Learning Objective 3: The participant will be able to list several ways to optimize the uptake of psychosocial ADHD interventions.

The Importance of Social Impairment in the Prevention of Depression in Adolescents With ADHD

Steven Evans, Ohio University

Hypothesis/Objective: Although there have been studies examining the risk of depression for adolescents with ADHD, there is a lack of clarity regarding specific risk factors. The objective of this presentation is to summarize recent research by our team to identify characteristics of adolescents with ADHD that increase the risk for developing depression during adolescence and then sharing intervention work related to those risk factors.

Methods: Three studies will be described that add information about risk factors including the role of onset of puberty. In the first study we examined the potential mediating role of social skills on the relationship between inattentive symptoms and depression and self-worth in two samples. The first included 219 middle school students diagnosed with ADHD and the second included 120 high school students diagnosed with ADHD. In the second study we report the results of a cross-lag analyses of data from the ABCD study examining the role of puberty, social impairment, academic impairment and other characteristics of 708 young adolescents diagnosed with ADHD. Finally, we will summarize recent treatment development and evaluation research focused on some of the implicated risk factors.

Results: Results from the first study indicated that social impairment did mediate the relationship between inattentive symptoms and depression and self-worth with the middle school students with ADHD and mediated depression with the high school students with ADHD over a one-year period. In the cross-lag analyses puberty was a significant moderator of risk factors associated with depression. Models were analyzed separately for boys and girls with the following risk factors: social impairment, academic impairment, family conflict, parent depression, and victimization. Although the contributions of these factors varied by sex, social impairment appeared to be a consistent contributor. Given the role of social impairment across both studies we describe the results of a treatment evaluation trial showing moderate to large sustained effects with high school students with ADHD and contrast these findings with our previous evaluation of a similar approach with middle school students.

Conclusions: These studies add clarity to the important role of social functioning during early adolescence in relation to the onset of puberty and depression. Although it is still not clear if the identified variables are causally related to the onset of depression, the results do identify some potential treatment targets. Some of these are not malleable (e.g., puberty), but others are potentially malleable (e.g., social impairment). In spite of limited progress in the area of effectively treating social impairment in youth with ADHD, there are encouraging reports that a novel approach may be effective for high school aged adolescents. Adaptations to these procedures may be necessary before seeing similar results with young adolescents.

The Importance of Attachment Processes in ADHD; A Novel Model for Attachment in ADHD and the Role of Attachment in Response to Behavioral Parent Training

Saskia Van der Oord, KU Leuven

Hypothesis/Objective: ADHD is impairing for the child and family, both on the short and longer term; children with ADHD are at risk for significant and accumulating behavioral and emotional problems and parent-child relations are often disrupted. Secure attachment can be a buffer against these risks and impairments, but surprisingly attachment is barely examined using state-of-art methodology in the context of ADHD. To learn to trust your parent, and to be ultimately develop secure attachment, adequate functioning of the neurotransmitter dopamine is crucial according to the influential Learning Theory of Attachment (Bosmans et al.,2020). Children with ADHD are often characterized by dopamine neurotransmission problems, impacting learning of stimulus response associations and reward responsiveness. Although not

examined to date, these problems likely also have implications for learning of trust and becoming securely attached to parents. In this presentation we present a novel model, fueled by the influential Learning Theory of Attachment, on how children with ADHD may struggle to become securely attached (Van der Oord, Dekkers.. & Bosmans, in prep). Also, we present evidence on how attachment representations may impact response to changes in parenting and reward provided by their parents (Hornstra et al., 2022). Specifically, we investigated whether specific behavioral techniques (i.e antecedent and reward based techniques) were more or less effective for children with ADHD in relation to their attachment representations.

Methods: We included parents of 74 children with ADHD (4-11 years, M=8.15) who took part in a larger randomized controlled microtrial in which they were randomized to a two session training in antecedent-based techniques (i.e., stimulus control techniques: rules, instructions; n=26), a two session training in primarily reward-based techniques (i.e., contingency management techniques: praise, rewards; n=25) or a waitlist control condition (n=23). We examined whether attachment representation moderated the effectiveness of a) training versus waitlist, and b) antecedent- versus consequent-based techniques. Attachment representations were measured with a state of art measurement of attachment i.e. a story stem task, the intervention outcome was daily parent-rated problem behaviors of the children.

Results: Attachment representation did not moderate the effects of the training compared to the waitlist. However, compared to antecedent-based techniques, reward-based techniques were less effective for more securely and less disorganized attached children, and particularly effective for more disorganized attached children.

Conclusions: Our result indicate that reward responsiveness in ADHD and attachment may be related, which aligns with our proposed model of ADHD and attachment This was the first study examining attachment as a moderator of behavioral techniques for ADHD. If replicated, the findings of this study can be used for treatment development and tailoring, and fuel research on attachment and ADHD.

- Bosmans, G., et al. (2020). A learning theory of attachment: Unraveling the black box of attachment development. Neuro Biobehav Rev, 113, 287-298.

- Hornstra, R., Dekkers, T., Bosmans, G., van den Hoofdakker, B., Van der Oord, S. (2022). Attachment representation moderates the effectiveness of behavioral parent training techniques for children with ADHD: evidence from a randomized controlled microtrial. Research on Child and Adolescent Psychopathology, 50, 1151-1164.

- Van der Oord, S., Dekkers, T., Danckaerts, M., Bosmans, G. (in prep). The learning theory of attachment in ADHD: a novel model to understand attachment in ADHD.

Evidence-Based Treatment for Children With ADHD: Challenges and Solutions

Tycho Dekkers, Accare Child Study Center, University of Groningen, the Netherlands

Hypothesis/Objective: For children with ADHD, several interventions with a robust evidence-base are available. The implementation of these interventions in clinical practice, however, is

suboptimal, which negatively impacts many children and their families. In this talk, I will discuss this problem from three perspectives.

Methods: First, I will present three recent studies from our PAINT (Psychosocial ADHD Interventions) research consortium, in which we detected facilitators and barriers towards evidence-based practice for ADHD (survey studies in clinicians [N=219] and school mental health professionals [N=115], and a longitudinal observation study in parents of children with ADHD [N=126]). These studies demonstrate that guidelines are often not followed, many children with ADHD receive interventions without a solid evidence base, and many factors determine families' treatment choices.

Results: Second, I will discuss one particular finding in detail: Context-focused interventions (i.e. behavioral parent/teacher training) are recommended by all guidelines, but their uptake is problematic. We therefore developed a brief and more accessible intervention of only three sessions. I will discuss pilot work (N=29 families), showing that this brief intervention has promising effects, as well as our three ongoing randomized controlled trials in different settings.

Conclusions: Third, I will argue that the current narrative around ADHD, with a predominant emphasis on biological causes, is a crucial factor driving treatment selection. A too narrow biological perspective on ADHD may lead to decontextualization, which is the believe that children, or their brains, are primarily responsible for their symptoms. This narrative logically leads families towards child-focused solutions, and prevents them from selecting evidence-based contextual interventions.

Friday Evening Plenary: Neurodiversity in ADHD Across the Lifespan

04:15 PM - 05:15 PM

Friday Evening Plenary: Neurodiversity in ADHD Across the Lifespan

Chair: Jeffrey Newcorn, Mount Sinai Medical Center

Presenters:

Saskia Van der Oord, KU Leuven

Margaret Sibley, University of Washington

Jeffrey Newcorn, Mount Sinai Medical Center

Karen Saporito, Integrative Psychology Associates of South Jersey, LLC

Overall Abstract:

Learning Objective 1: Participants will learn what the neurodiversity concept means, and how it was adapted from the field of autism to ADHD.

Learning Objective 2: Participants will learn the potential impact of the neurodiversity paradigm for ADHD and , and how it may impact both psychosocial and pharmacologic treatment.

Learning Objective 3: Participants will learn how the neurodiversity paradigm can influence ADHD the manner in which ADHD is currently diagnosed.

Neurodiversity and ADHD

Saskia Van der Oord, KU Leuven

Description: Neurodiversity is a paradigm that origines from the field of Autism. To date, in the field of ADHD there has been less interest in this paradigm, although it is gaining popularity through neurodiversity movements and social media advocates. The neurodiversity paradigm implies a very different way of thinking about ADHD. This presentation explains neurodiversity, what neurodiversity can mean for thinking about ADHD, for working with people with ADHD and how it can shape the future of ADHD and ADHD research. All this is illustrated by research in ADHD of important concepts for the neurodiversity paradigm.

Panelists

Margaret Sibley, University of Washington

Jeffrey Newcorn, Mount Sinai Medical Center

Karen Saporito, Integrative Psychology Associates of South Jersey, LLC

Drs. Sibley, Newcorn, and Saporito will join the panel after Dr. Van Der Oord's talk to offer comments on the intersection between neurodiversity and psychosocial treatment for ADHD.

TABLE TALK with Experts

5:30 PM – 6:30 PM

Topics and Speakers:

Neurodiversity : Eliza Barach, Traci Kennedy, Michelle Ronayne, Heather Potts

Autism: Karen Saporito, Steve Pliszka

Executive Function: Maria Edman

Psychopharm in Peds: Jeff Newcorn, Ann Childress

Psychopharm in Adults: Len Adler, John Ringhisen

ADHD & Substance Use: Fran Levin,Tim Wilens, Mariely Hernandez

Public Health Trends: Lara Robinson, Karyl Rattay, Angelika Claussen

Lifestyle & ADHD: Saskia van der Oord, Jenni Johnstone

SATURDAY, JANUARY 18, 2025

***Late-Breaking Data: Viloxazine ER*, with breakfast, by Supernus**

7:00 AM – 9:00 AM

An Update on Adult U.S. ADHD Guidelines

8:00 AM – 9:00 AM

Chair: Gregory Mattingly, Midwest Research Group

Presenters:

Len Adler, NYU School of Medicine

Frances Levin, Columbia University Irving Medical Center

John Ringhisen, SUNY Upstate Medical University

Margaret Sibley, University of Washington

Brooke Molina, University of Pittsburgh

Overall Abstract: This session will review the history, development, and current status of the APSARD United States Adult ADHD Guidelines for the Diagnosis and Treatment of ADHD in Adulthood. In his 2011 Presidential Address to APSARD, Len Adler proposed the development of Practice Principles as a stepping-stone to establishing national guidelines (Adler LA Presidential Address APSARD 2011, Washington DC). Key Committee Chairs will review the APSARD Quality Measure (QM) Initiative, its ten practical QMs' development, and subsequent field testing. The rationale necessitating development of US Adult ADHD Guidelines will be presented alongside the process for establishing the Task Force's structure. The composition and operating procedures of all Guideline Committees and Subcommittees will be discussed. The timeline and methodology for collection and incorporation of public commentary, anticipated in mid-2025, will be presented. Procedures for including APSARD membership feedback will be discussed.

Recent Science on Lifestyle Interventions for Childhood ADHD: Are Modifications to Sleep, Exercise, and Diet Helpful?

09:15 AM - 10:45 AM

Recent Science on Lifestyle Interventions for Childhood ADHD: Are Modifications to Sleep, Exercise, and Diet Helpful?

Chair: Brooke Molina, University of Pittsburgh

Presenters:

Jeanette Johnstone, OHSU

Jessica Lunsford-Avery, Duke University Medical Center

Betsy Hoza, University of Vermont

Overall Abstract: Lifestyle changes that include sleep, exercise, and diet have long been of interest to clinicians and researchers for their potential to improve behavioral, emotional, and

cognitive health for children with ADHD. In this symposium, three investigators who have been studying these potential intervention targets will present recent findings from their research. 1) Sleep disturbances are common in ADHD, particularly during adolescence, and may represent a physiological mechanism contributing to functional deficits, for example by worsening executive functioning (EF). Dr. Jessica Lunsford-Avery will share her findings that in adolescents, those with ADHD spent less time in deep, slow wave sleep measured with polysomnography, and that disrupted sleep physiology was related to poorer EF in the ADHD group. Strategies for assessing and treating disrupted sleep physiology in ADHD will be discussed. 2) Physical activity administered during periods of rapid brain growth may have the potential to alter neurodevelopmental trajectories that include ADHD. Dr. Betsy Hoza will describe research on a physical activity program for preschoolers (Kiddie CATs on the Move) that demonstrates improved school readiness for preschoolers participating in the program. Critically, for preschoolers at neuropsychological risk for ADHD, higher amounts of moderate-to-vigorous physical activity may be especially beneficial for reducing inattention, hyperactive/impulsive, and peer difficulties. Meeting recommended physical activity guidelines at the preschool level may be a critical piece of promoting optimal development for all children including those vulnerable to ADHD. 3) Nutritional supplementation and diet are other modifiable targets that have been of interest for improving child mental health including ADHD. Dr. Jeanette Johnstone will present the results of blinded, randomized controlled trials of multinutrient supplementation in children with ADHD. Using blinded clinician ratings of global improvement, children who received micronutrient (vitamins/minerals) supplementation over 8 weeks had higher treatment response, 54%, relative to the placebo group, 18%, and they grew more, 6 mm more. Mechanistic signals from biological samples will be presented. Although diet alone may be insufficient to meaningfully change ADHD, families may be encouraged to start with a “whole foods” diet approach by reducing or eliminating processed foods high in salt, fat, sugar, artificial colors, flavors, and sweeteners.

Learning Objective 1: Describe differences in sleep between adolescents with and without ADHD

Learning Objective 2: Consider the implications of sleep deficiencies in ADHD treatment planning

Learning Objective 3: Understand the current state of the science regarding physical activity interventions for pediatric ADHD

Learning Objective 4: Describe the Kiddie-CATs on the Move program for preschoolers and its implications for ADHD

The Role of Multinutrient Supplementation and Diet in Children With ADHD

Jeanette Johnstone, OHSU

Hypothesis/Objective: Nutritional supplementation with multinutrients (i.e., vitamins, minerals, amino acids, and antioxidants) has been of interest for improving ADHD and related symptoms (e.g., irritability) due to their function in brain processes.

Methods: In two blinded, randomized controlled trials of children with ADHD and emotional dysregulation (N=93 and N=126), and one in adults (N=80) conducted among three countries (New Zealand, Canada and the United States) and in 4 locations, parents and another adult, or the adult themselves, rated behavioral outcomes following 8-10 weeks of multinutrient supplementation. Biological samples including blood, urine, stool, saliva and hair were collected from a subsample of the participants to examine moderators, mediators, and signals of change over time. In addition, data from dietary studies for ADHD were reviewed.

Results: On average, half of the participants (47-54%) in the multinutrients group were rated as "treatment responders" based on the blinded Clinical Global Impression-Improvement (CGI-I) versus 18-28% in placebo. Parents reported behavioral symptoms improved in both groups (multinutrient and placebo); while teachers/other adults reported improved peer relationships in the multinutrient group compared to placebo. When parents nominated their child's most concerning problem and reported on its frequency, duration and impairment over time, inattention, depression, and anxiety improved more in the multinutrient group. Children in the multinutrient group grew 6mm more in 8 weeks than those on placebo – if that trend continued for a year, the growth would be 36mm, or 1.4 inches. Adverse events between the two groups were equal. Six meta-analyses showed small to moderate effects for Omega-3 fatty acid supplementation, with 3 months to show benefit. Signals of multinutrient biological mechanisms included reducing inflammation, evidenced by reduced plasma cytokine and oxidative stress markers, and increased butyrate producing stool bacteria.

Conclusions: Supplementing with multinutrients has shown benefit for attention, depression and anxiety symptoms in children with ADHD, as well as in adults. Due to small effect sizes, Omega-3s may be best as an adjunctive, rather than primary treatment. Reduced inflammation is one signal of benefit from multinutrient and Omega-3 supplementation. While an individual's diet represents a modifiable target for improving mental health, and may improve ADHD symptoms, diet alone may be insufficient or difficult to implement. Families may be encouraged to start with a "whole foods" diet approach by reducing or eliminating processed foods high in salt, fat, sugar, artificial colors, flavors, and sweeteners.

Sleep and Pediatric ADHD: Physiological Mechanisms, Cognitive Correlates, and Treatment Opportunities

Jessica Lunsford-Avery, Duke University Medical Center

Hypothesis/Objective: Attention-Deficit/Hyperactivity Disorder (ADHD) is associated with substantial academic and interpersonal impairment. Sleep disturbances are common in ADHD, particularly during adolescence, and may represent a physiological mechanism contributing to functional deficits, for example by worsening executive functioning (EF). Disrupted sleep physiology in ADHD may also emerge early in life. The aims of this study were to: identify differences in sleep physiology among adolescents with ADHD compared to healthy controls (HC), examine associations between sleep physiology and impaired EF, and assess associations between adolescent sleep physiology and sleep in early development.

Methods: Medication-free adolescents aged 13 to 17 (N=62, n=31 with ADHD; mean age=15.3 years; 50% female) completed a diagnostic evaluation, 3 nights of ambulatory sleep assessment (i.e., polysomnography), and subjective and objective EF measures. Caregivers reported on participants' sleep problems during toddlerhood and preschool. Partial Pearson correlations and linear regressions covarying for age, sex, and pubertal status tested study hypotheses.

Results: Adolescents with ADHD spent less time in deep, slow wave sleep (β=−.40) and more time in light, stage 2 sleep (β=.41) than HC. Lower overall slow wave activity (r=.48) and disrupted patterns in slow wave activity (r=-.54) were associated with poorer EF in the ADHD group. Adolescents with ADHD also had greater caregiver-reported early childhood sleep problems compared to HC (t(60)=3.71). In the full sample, greater sleep problems in early childhood were associated with reduced slow wave sleep (β=-.28) and slow wave activity (β=-.27) in adolescence, and the association was stronger for adolescents with ADHD than HC (β=1.09). All p's<.05.

Conclusions: Disrupted sleep physiology, particularly to deep slow-wave sleep, characterized adolescents with ADHD compared to HC and was linked to EF deficits, suggesting a possible mechanism underlying ADHD-related functional impairments. Critically, these patterns suggest an insomnia-related process occurring in adolescents with ADHD that is targetable through behavioral sleep interventions. Results also suggest that ADHD-related sleep problems may begin early in life and persist into adolescence, highlighting the potential impact of early interventions for improving sleep and EF in ADHD across development. Strategies for assessing and treating disrupted sleep physiology in ADHD will be discussed.

Using Physical Activity to Promote Health Equity: Introducing Kiddie CATs on the Move

Betsy Hoza, University of Vermont

Hypothesis/Objective: Lifestyle interventions such as physical activity (PA), administered during periods of rapid brain growth such as the preschool years, have largely untapped potential to alter developmental trajectories toward full-blown neurodevelopmental disorders such as ADHD. Our objective is to introduce the Kiddie CATs on the Move program as one such potential intervention and describe our pilot results during the past 5 years.

Methods: Within a program evaluation framework, we've used objective measures of PA (i.e., accelerometry) to evaluate the effectiveness of Kiddie CATs at promoting PA and to explore how early childhood PA is linked to a variety of outcomes, either concurrently or over time, such as compliance with PA guidelines, improved school readiness across a school-year, and adaptive change in ADHD symptomatology.

Results: We will summarize published and in-progress work demonstrating the need for, development of, and early studies of Kiddie CATs on the Move, as a potential universal intervention to promote preschoolers' school readiness with potential implications for prevention of neurodevelopmental disorders. Key findings from these studies indicate the need to adapt PA curricula used with early elementary-aged children to meet the developmental needs of preschoolers with a wide range of capabilities (Meyer et al., 2020) and to monitor compliance

with PA guidelines to promote adequate daily PA (Tompkins et al., 2019). Our initial work demonstrates that children engaged in more moderate-to-vigorous PA (MVPA) on Kiddie CATs days than on days when Kiddie CATs was not administered. Further, meeting a PA guideline was associated with improved school readiness in five of six school readiness domains (Hoza et al., 2020a). Critically, for preschoolers at neuropsychological risk for ADHD, higher amounts of MVPA may be especially beneficial for reducing inattention, hyperactive/impulsive, and peer difficulties (Hoza et al., 2020b).

Conclusions: The possible preventive benefit of large scale preschool-based PA programs implemented with children at risk for neurodevelopmental disorders should be studied in future research. Furthermore, meeting recommended PA guidelines at the preschool level may be a critical piece of promoting optimal development for all children.

The ADHD Multiplex Family: Characteristics and Treatment Considerations From the Perinatal Period Through Adolescence

09:15 AM - 10:45 AM

The ADHD Multiplex Family: Characteristics and Treatment Considerations From the Perinatal Period Through Adolescence

Chair: Douglas Russell, University of Washington / Seattle Children's

Presenters:

Elyse Mark, University of Pittsburgh School of Medicine

Douglas Russell, University of Washington / Seattle Children's

Andrea Chronis-Tuscano, University of Maryland

Overall Abstract: ADHD is common and highly heritable. Our understanding of how the condition impacts relational health within the family system is robust and growing. This symposium will explore characteristics of and treatment considerations for ADHD multiplex families. Elyse Mark will present data from the Newborn Pittsburgh ADHD Risk in Infancy Study (PARIS) to illuminate how parental ADHD might affect the parent-child dyad during the perinatal period. Douglas Russell, MD will share findings from a qualitative study exploring aspects of the ADHD multiplex family through the voices of parents, adolescents, primary care providers and mental health professionals. Andrea Chronis-Tuscano, PhD will describe the Treating Parents with ADHD and their Children (TPAC) study, a hybrid effectiveness-implementation trial comparing psychostimulant treatment of parental ADHD plus behavioral parent training to behavioral parent training alone in urban pediatric primary care clinics. Parental ADHD can affect early attachment bonds. Parental attitudes toward ADHD, including their own experience of the condition, may inform relational health of the ADHD multiplex family. Treating ADHD symptoms in the parent may improve capacity to enact positive parenting practices. Distribution of ADHD symptoms in a family system has implications for relational health starting in the prenatal period and extending throughout development. As

recognition of ADHD in adulthood increases, clinicians should consider adopting a family-based approach to the assessment and treatment of ADHD.

Learning Objective 1: Explore the effects of parental ADHD on early relational health during the perinatal period

Learning Objective 2: Review characteristics of the ADHD mjultiplex family

Learning Objective 3: Consider treatment implications for ADHD multiplex families

Differential Impacts of Parental ADHD on Early Maternal-Infant Attachment

Elyse Mark, University of Pittsburgh School of Medicine

Hypothesis/Objective: Parental ADHD is associated with increased postpartum depression (PPD) symptoms, impaired daily functioning, and increased parenting distress in the first year of infant life, yet its impact on parental bonding in the postpartum period remains unexplored. This study tests the hypothesis that parent (including coparent) ADHD is associated with impaired early maternal-infant attachment (MIA).

Methods: 78 mother-father-infant triads, half with and half without parental ADHD, were enrolled during pregnancy or postpartum for a longitudinal study examining early signals of risk for developing ADHD. Mothers completed questionnaires on social support, home chaos, PPD, and early attachment to their infants (M=4 weeks of age). Participants enrolled in pregnancy (n=45) also reported antenatal MIA in the third trimester. ANOVA was used to compare attachment among mothers without ADHD (n=44), mothers with ADHD (n=21), and mothers with ADHD coparents (infants' fathers; n=13). Multilevel linear regression was used to examine environmental and psychiatric predictors of MIA.

Results: Mothers with ADHD reported greater PPD ($p<.05$) and home chaos ($p<.01$) than mothers with ADHD coparents or those without parental ADHD. Mothers with ADHD coparents reported the poorest overall MIA and quality of attachment, as well as the greatest hostility towards their infants ($p<.05$). In the final model for MIA, PPD symptoms ($B=-.85$, $p<.001$) and coparent ADHD ($B=-4.70$, $p=.051$) were associated with poorer MIA ($R^2=.40$, $p<.001$). When examining MIA subscales, PPD was negatively correlated with subscales measuring quality of attachment and absence of hostility, but not pleasure in mother-child interaction. When antenatal attachment was included, it ($B=.65$, $p=.002$), along with PPD ($B=-.60$, $p=.032$), predicted postnatal MIA ($R^2=.50$, $p<.001$).

Conclusions: This study presents novel evidence that parental ADHD (mother or father) is associated with increased maternal postpartum depression and less optimal early MIA. Additional support for families with ADHD in the perinatal period may improve maternal and infant mental health outcomes.

Elevating Community Voices to Understand the Needs of ADHD Multiplex Families

Douglas Russell, University of Washington / Seattle Children's

Hypothesis/Objective: Existing medication and psychosocial treatments are effective at reducing ADHD symptoms and reducing parent stress, but their effectiveness at preventing negative functional and health outcomes in families is less certain. We aim to better understand the needs of ADHD Multiplex Families by learning from the lived experience of families with ADHD and providers that care for them.

Methods: We are convening four focus groups (8-10 per group) comprised of key community partners: (1) Adults with ADHD whose children have ADHD, (2) Adolescents with ADHD, (3) Mental Health Professionals (MHPs) representing the fields psychiatry, psychology, psychiatry advanced practice nursing, school-based counseling, and (4) Primary Care Providers (PCPs). All data will be entered into a qualitative software system for management (Dedoose) and analyzed with a combination of deductive and inductive methods.

Results: Data is currently being collected and will be ready by the conference. Results of this qualitative study will inform the development of a new clinical program serving ADHD multiplex families. It is important to elevate the voices of diverse families in ADHD research and care, which historically have struggled with representation despite evidence of high ADHD prevalence.

Conclusions: Qualitative study involving community partners is a well-established methodology in ADHD research that is feasible across developmental stages and professional disciplines. Novel care strategies will be required if we are to transfer emerging knowledge about ADHD Multiplex Families into clinical practice. This starts with a thoughtful needs assessment that elevates community voices.

Treating Parents With ADHD and Their Children: Review and Preliminary Findings

Andrea Chronis-Tuscano, University of Maryland

Hypothesis/Objective: To review literature on the links between parent ADHD and parenting behavior and literature on efforts to treat parent ADHD to improve child and family functioning; and to present preliminary data on the treating Parents with ADHD and their Children (TPAC) study.

Methods: 120 parents with ADHD and their 3-8 year old children were recruited in the Washington DC metropolitan area from urban pediatric clinic screening, provider referrals, and community outreach. Eligible dyads were randomized to receive integrated behavioral parent training (targeting both parenting and parent mental health), with or without parent stimulant medication, and followed for 36 weeks. Treatments were delivered by real-world integrated behavioral health providers via telehealth. All aspects of the study were informed by community partner groups consisting of pediatricians, behavioral health providers, parents and office staff in order to enhance generalization and sustainability.

Results: Data collection is in progress and will be completed prior to the conference. Analyses will address recruitment, retention, treatment engagement and preliminary outcomes on parent, child and family functioning.

Conclusions: Research on families in which both the parent and child have ADHD is critical given the genetic transmission of the disorder and impact on parenting and child outcomes. The TPAC study represents an advancement beyond existing research in that we are using a hybrid effectiveness-implementation design with diverse families, and examine multi-modal treatments. This study has potential to inform real-world implementation of screening and treatment of ADHD in families.

CDC: ADHD Data for Action Across the Lifespan

09:15 AM - 10:45 AM

CDC: ADHD Data for Action Across the Lifespan

Chair: Ann Childress, Center for Psychiatry and Behavioral Medicine, Inc.

Presenters:

Lara Robinson, Centers for Disease Control & Prevention

Angelika Claussen, Centers for Disease Control and Prevention

Karyl Rattay, CDC

Overall Abstract: ADHD is a public health concern—with impacts on individuals, families, communities, educational systems, and health care. This session describes how the National Center on Birth Defects and Developmental Disabilities within the Centers for Disease Control and Prevention (CDC) works to understand and address ADHD public health impacts across the lifespan. This session will describe how CDC puts data to action to promote optimal health and wellbeing for individuals with ADHD. Three presentations will discuss ADHD across development: 1) Prenatal and early childhood: modifiable ADHD risk factors for prevention as identified by a comprehensive series of systematic reviews and meta-analyses, 2) Childhood and adolescence: ADHD prevalence, treatment and health risk behaviors among youth with ADHD using nationally representative survey data and 3) Adulthood: new data on adult ADHD prevalence, treatment, and associations with suicide across the life course using a nationally representative rapid survey system. We will describe how CDC uses data to address knowledge gaps, inform policy, and improve outcomes for people with ADHD.

Learning Objective 1: Describe the initiatives of the National Center on Birth Defects and Developmental Disabilities to address ADHD's public health impact, and assess their effectiveness in improving ADHD outcomes across the lifespan.

Learning Objective 2: Describe possible early childhood risk factors for ADHD and examine examples for public health policy, systems, and environment changes that can address these risk factors.

Learning Objective 3: Discuss new data on adult ADHD prevalence, treatment, and associations with suicide.

Using Nationally Representative US Data to Inform Public Health Practice and Policies for Adults With ADHD

Lara Robinson, Centers for Disease Control & Prevention

Hypothesis/Objective: There are limited data on ADHD diagnosis, treatment, and mortality among adults in the United States (US) to inform public health efforts. Timely data are needed to inform adult clinical guidelines, currently under development, and policy level and regulatory decision-making for the treatment of ADHD and prevention of early mortality. In addition, people with ADHD may be at higher risk for suicide but data are lacking to identify what factors may potentiate risk and which factors may mitigate risk. Data from two nationally representative studies will be presented.

Methods: Study 1) CDC scientists used data from the National Center on Health Statistics (NCHS) Rapid Surveys System collected in October-November 2023 to estimate the prevalence of ADHD diagnosis and treatment among U.S. adults. Study 2) CDC scientists used data from the National Violent Death Reporting System (NVDRS) to examine demographics and descriptive characteristics, circumstances preceding suicides, and toxicology results among persons, with and without known ADHD.

Results: Study 1) Almost 15.5 million U.S. adults (6.0%) had a current ADHD diagnosis, based on self-report; over half were diagnosed at age 18 years or older. About 1/3 of adults with ADHD took a stimulant medication to treat their ADHD in the past year, 71.5% of whom had difficulty obtaining their ADHD medication because it was not available. Almost half of adults with ADHD have ever used telehealth for ADHD-related services. Study 2) Preliminary data indicate 4,457 of the suicide deaths among adults from 2003-2022 were individuals with known ADHD; additional data will also be presented that characterize the decedents and circumstances associated with the suicide.

Conclusions: These studies provide national estimates of the prevalence and treatment of ADHD among U.S. adults along with the descriptive characteristics and circumstances of suicide deaths among those with known ADHD. The studies also characterize factors associated with gaps and opportunities in the treatment landscape of ADHD and the reporting of an ADHD diagnosis in suicide data. Public health professionals can use the findings from this report to inform policies currently being developed and evaluated related to ADHD clinical care for adults, access to prescription stimulant medications, and flexibilities related to telehealth, in addition to suicide prevention programs.

Public Health Surveillance of ADHD in Children and Adolescents

Angelika Claussen, Centers for Disease Control and Prevention

Hypothesis/Objective: ADHD is a common neurodevelopmental disorder with increased risk for poor mental and physical health and lower life expectancy. CDC conducts public health surveillance of ADHD in children and adolescents to describe a comprehensive picture of ADHD diagnosis and treatment, to understand associated health risks, and to identify gaps in services. We will present data from two studies.

Methods: Study 1) CDC scientists used data from the 2022 National Survey of Children's Health (NSCH) to estimate the current prevalence of ADHD diagnosis and treatment among children 3 to 17 years of age. Parents reported their child's ADHD based on healthcare provider diagnosis, ever and current. Parents also report on their child's ADHD treatment, including medication treatment and behavioral therapy. We examined the associations between demographic factors and ADHD diagnosis and treatments. Weighted prevalence estimates and prevalence ratios with 95% confidence intervals (CIs) were calculated. Study 2) CDC scientists used data from the National Health Interview Survey – Teen to examine self-reported factors related to social-emotional well-being and health behaviors among teens aged 12 to 17 years with ADHD. ADHD was identified by parent report of current ADHD based on healthcare provider diagnosis. Teen self-report included bullying, social support from peers, parents, and community, friendship, depression, anxiety, life satisfaction, sleep, physical activity, screen time, and concerns about weight. Weighted prevalence estimates and prevalence ratios adjusting for age, sex, and family income (aPR) with 95% confidence intervals (CI) were calculated.

Results: Study 1) Approximately 1 in 9 U.S. children have ever received an ADHD diagnosis (11.4%, 7.1 million children) and 10.5% (6.5 million) had current ADHD. Among children with current ADHD, 58.1% had moderate or severe ADHD, 77.9% had at least one co-occurring disorder, approximately half of children with current ADHD (53.6%) received ADHD medication, and 44.4% had received behavioral treatment for ADHD in the past year; nearly one-third (30.1%) did not receive any ADHD-specific treatment. Study 2) Teens with ADHD reported higher prevalence of bullying victimization (aPR = 1.64, CI: 1.27–2.11), difficulties making friends (aPR=1.83, CI=1.15–2.90), difficulty getting out of bed (aPR = 1.29, CI: 1.02–1.64), irregular wake times (aPR=2.17, CI=1.45–3.25), and >4 hours daily screen time (aPR=1.26, CI=1.05–1.52) than teens without ADHD; teens with ADHD reported a lower prevalence of lacking peer support (aPR=0.70, CI=0.51-0.96).

Conclusions: CDC uses data from multiple sources to understand ADHD in children and adolescents. This information on treatment gaps and health related risks can be used by policymakers, government agencies, health care systems, public health practitioners, and other partners to plan for needs of children with ADHD.

Modifiable ADHD Risk Factors for Public Health Prevention in the Prenatal Period and Early Childhood

Karyl Rattay, CDC

Hypothesis/Objective: Supporting people with Attention-Deficit/Hyperactivity Disorder (ADHD) to achieve their optimal health and well-being is part of the mission of the National Center on Birth Defects and Developmental Disabilities within the U.S. Centers for Disease Control and Prevention (CDC). ADHD is one of the most common neurodevelopmental disorders with significant individual and societal negative impacts continuing into adulthood. Genetic and environmental risk (e.g., modifiable exposures such as prenatal tobacco exposure and child maltreatment) for ADHD is likely multifactorial. However, the evidence for potentially modifiable contextual risks is spread across studies with different methodologies and ADHD

criteria limiting understanding of the relationship between early risk factors and later childhood ADHD.

Methods: Using a public health approach to address prior gaps in the literature, CDC used a common methodology to conduct six meta-analyses examining 59 potentially modifiable risk factors for childhood ADHD. Risk factors were generally measured prenatally or in early childhood and only longitudinal or retrospective studies in which the measurement time period for the risk factor clearly preceded the measurement time period for ADHD were included. These factors are grouped into the following categories: pregnancy-related, chemical, parent mental health, parent substance use disorders, parenting, and child health.

Results: Collectively these papers illustrate how ADHD may be affected by many different risk factors shared across socio-ecological contexts, without a single risk factor being determinative for prevention. Risk factors with significant associations with ADHD symptoms and/or diagnosis identified in these papers include exposures within the prenatal, child, family, and community ecological contexts. Risk factors with the strongest effect sizes and/or significant associations across ADHD diagnosis and symptomatology measurement are prenatal exposures of maternal alcohol and tobacco use, maternal first trimester antidepressant use, and prenatal testosterone exposure (as measured by finger length ratio); child health factors such as absence of breastfeeding, sleep problems, head injury, neonatal illness, and childhood infection (e.g., prenatally and postnatally, viral and bacterial); family factors associated with parent-child relationship challenges, family conflict or economic risk (e.g., divorce, single parenting, maltreatment, and physical abuse), media exposure, parental depression, parental stress and anxiety, parent substance use disorder, parent antisocial personality disorder; and community level exposures such as organophosphates and lead.

Conclusions: This presentation will provide examples of public health approaches focusing on policy, systems, and environmental changes across socio-ecological contexts to improve health and wellbeing through prevention, early intervention, and support across development using findings from these meta-analyses. Use of these findings in public health efforts has the potential to minimize risk, prioritize prevention efforts, and improve the long-term health and wellbeing of children and adults with ADHD.

Genetics of ADHD, What the Clinicians Need to Know

11:00 AM – 12:30 PM

Genetics of ADHD, What the Clinicians Need to Know

Chair: Anne Arnett, Boston Children's Hospital

Presenters:

Anne Arnett, Boston Children's Hospital

Russel Schachar, The Hospital for Sick Children, U of Toronto

Overall Abstract: Genomic testing is increasingly used in clinical settings to interrogate the etiology of neurodevelopmental and medical disorders, and to guide precision medicine care. Evaluation of the validity of clinical genomics requires understanding of the methods, as well as their inherent limitations. Dr. Arnett will start the plenary with an introduction

Learning Objective 1: Describe the differences between common and rare genetic variants.

Learning Objective 2: Discuss the role of genetics in the etiology of ADHD and its individual variability.

Learning Objective 3: Assess the state of genomic methods for diagnosing and treating ADHD.

Introduction to Clinical Genetics

Anne Arnett, Boston Children's Hospital

Hypothesis/Objective: Genomic testing is increasingly used in clinical settings to interrogate the etiology of neurodevelopmental and medical disorders, and to guide precision medicine care. Evaluation of the validity of clinical genomics requires understanding of the methods, as well as their inherent limitations. This presentation will provide an overview of clinical genetics.

Methods: The presentation will cover the basics of genetic and genomic analyses, starting with a review of genomic architecture and function. Next, we will review common analytic methods, including whole genome and exome sequencing, genome wide association, polygenic risk, and rare variant discovery.

Results: The associations between genetic expression and human behavior will be reviewed, with particular attention to developmental and environmental moderators (i.e., epigenetics).

Conclusions: Clinical genomics is a burgeoning field with potential for informing precision medicine care for individuals with ADHD.

The Genetics of ADHD: An Update

Russel Schachar, The Hospital for Sick Children, University of Toronto

Hypothesis/Objective: Genomics is the study of the entire genome and interactions among genes and the environment. Genomics promises advancements in the understanding of ADHD's mechanism, diagnosis, differential diagnosis, and treatment. The presentation will summarize the evidence for genetic influences on ADHD including family, twin, genome-wide association (GWAS) and copy number variation studies and consider how far genomics has come in addressing clinically important challenges.

Methods: Priority will be given to evidence derived from meta-analysis of existing data, followed by systematic reviews and individual studies. A case will be presented to illustrate the role of genetic information in clinical practice. Both genomic studies in clinical samples and in the general population will be considered.

Results: There is clear evidence for a genetic contribution to ADHD. Family and twin studies indicate that ADHD is one of the most heritable mental health conditions of children and youth. GWAS has identified fewer than 20% of suspected genetic risks for ADHD. Several studies of copy number variation in ADHD support the hypothesis that rare, as well as common, genetic risks play a role in the disorder. Genetics offers some insights into the molecular mechanism of ADHD, and the comorbidity of ADHD with other mental health conditions such as autism spectrum disorder, conduct disorder, and learning difficulties. Considerable further research will be required to translate these genomic advances into new assessment tools and treatment strategies. For the most part, genomic research has not included individuals of diverse ethnic backgrounds which limits the clinical utility of existing evidence.

Conclusions: Genomics offers an important window into the biology of mental illness. However, the promise of precision mental health practice driven by genetics has yet to be fully realized. Only a small portion of the suspected genetic risks for ADHD have been identified to date and the generalizability of these findings to people of all ethnic backgrounds and environments is uncertain. Further study is clearly required.

Tris Pharma Poster Hall **with Boxed Lunches**

12:30 PM – 2:00 PM

Advancing ADHD Therapy: Exploring Current and Emerging Treatment for Both Adults and Pediatrics

2:00 PM – 3:00 PM

ADHD & Trauma

3:15 PM – 4:45 PM

Chair: Jeffrey Newcorn, Mount Sinai Medical Center

Presenters:

Iris Manor, Geha MHC

Mai Uchida, Massachusetts General Hospital

J. Antoni Ramos-Quiroga, Vall d'Hebron University Hospital. Autonomous University of Barcelona

Learning Objective 1: To investigate the association between adult ADHD and inflammatory biomarkers.

Learning Objective 2: Participants will understand that ADHD is a risk factor for PTSD, and PTSD is a risk factor for ADHD, hich may serve to explain the overlapping clinical and neurobiological profiles of these disorders.

Learning Objective 3: Participants will be able to recognize the diagnostic and treatment challenges in managing ADHD and PTSD in children, understand the complexities of trauma's impact on ADHD symptoms, and critically assess the need for better-defined guidelines on continuous trauma and its long-term effects on children and families.

Children with ADHD during Wartime

Iris Manor, Geha MHC

Hypothesis/Objective: The relationship between Attention Deficit Hyperactivity Disorder (ADHD), trauma, and Posttraumatic Stress Disorder (PTSD) has gained research attention for years. ADHD, the most common neurodevelopmental disorder in childhood, is characterized by inattention, hyperactivity, and impulsivity. Acute traumatic stress and PTSD, resulting from traumatic events, are separated by their distance from the traumatic event and by their clinical symptoms. However, both involve intrusive symptoms, avoidance of mood and cognition changes, and altered arousal. Studies show that ADHD patients are more likely to develop PTSD. Children with ADHD are more vulnerable to stress as they are more receptive to changes, curious, and sensation-seeking. More than that, the demands from children at the time of war make it worse. While ADHD is hereditary, their parents may also have ADHD, which complicates the situation.

The symptom overlap between ADHD and PTSD challenges accurate diagnosis and treatment. Surprisingly, studies about ADHD acute traumatic stress/PTSD during childhood are scarce, and the concept of continuing trauma is missing.

Methods: Three case reports (CR) will be presented demonstrating the complex relationship between ADHD and PTSD during childhood and the clinical dilemmas in diagnosis and follow-up.

Results: The first CR demonstrates the diagnostic problem in a child who was already diagnosed four years ago with ADHD. He arrived as an urgent case to the clinic after October 7th, when he demonstrated severe behavioral and dysregulation problems. The second CR demonstrates a younger child who was never diagnosed with ADHD and, in his first year at school, went through the trauma of October. The last CR is of a family where the children were diagnosed and treated consistently for several years and came for "regular" follow-up visits after October 7th that were found to be irregular.

Conclusions: Four unanswered questions are raised during the discussion: the diagnostic complexity due to the clinical overlap; the usage and efficacy of treatment for ADHD, which is crucial for enabling trauma treatment and the possibility of the prevention of PTSD; the long-term effects of the traumatic disorder of the pregnant mothers; and the question of continuous/chronic traumatic stress, which is not defined in the DSM, though it is frequent, but has no guidelines of diagnosis and treatment.

Neural and Clinical Overlap of ADHD and PTSD

Mai Uchida, Massachusetts General Hospital

Hypothesis/Objective: Explore the evidence of ADHD being a risk factor for PTSD and the evidence for neurobiological vulnerability to PTSD in ADHD, and discuss clinical implications.

Methods: We conducted two studies. One study was a literature review and meta-analysis of the relative risk for PTSD in ADHD individuals. The second study examined the fear circuitry in individuals with ADHD compared to controls without ADHD by having the participants do a fear conditioning and extinction protocol and go through fMRI imaging.

Results: We found significantly increased relative risk for ADHD in PTSD individuals compared to controls who experienced similar traumatic experiences. We found deficient fear circuitry and deficient activation of vmPFC and hippocampus during extinction recall in ADHD individuals, which were similar to previous findings in PTSD individuals.

Conclusions: Patients with ADHD may be vulnerable to developing PTSD.

Inflammatory Biotypes in Adult ADHD and Chronic Stress

J. Antoni Ramos-Quiroga, Vall d'Hebron University Hospital. Autonomous University of Barcelona

Hypothesis/Objective: The study likely hypothesizes that there is a significant association between an "inflammatory biotype" (a distinct pattern of inflammatory protein levels) in individuals with ADHD and higher levels of chronic stress.

Methods: One hundred and twenty-six adults with ADHD were recruited from a multicenter study called PROBIA.Data collection occurred between 2019 and 2021. The dataset encompassed demographic characteristics, medical history, substance use, educational attainment, income, body mass index (BMI) measurements, and psychological assessments including the ADHD Rating Scale (ADHD-RS), the Perceived Stress Scale (PSS), and the UPPS-P Impulsive Behavior Scale.

Blood samples were drawn from fasting participants and processed to obtain plasma. The plasma samples were analyzed to quantify the levels of 92 inflammatory proteins using the OLINK Target 96 Inflammation panel. A data-driven approach was utilized, integrating clinical, psychological, and proteomic data to examine the intricate relationship between inflammation and ADHD in adults. Through statistical analysis, inflammatory biotypes were identified and their associations with stress, clinical severity, and suicidality were explored.

Results: - The study identified two distinct groups of adults with ADHD based on their inflammatory protein profile: a group with higher inflammatory potential (HIP) and a group with lower inflammatory potential (LIP).

-The HIP group was significantly associated with higher levels of perceived chronic stress.

-The HIP group also presented a higher risk of suicide and greater overall clinical severity. ADHD-specific medication did not have a significant effect on inflammatory protein levels.

Conclusions: "In conclusion, our data suggest the presence of two distinct biotypes in adults with ADHD."

"Higher levels of inflammatory proteins in ADHD are linked to higher levels of chronic perceived stress in a linear fashion."

"Further research on inflammation in adults with ADHD should take stress levels into account."

Seeking Information and Help for ADHD in the Modern Digital Era

03:15 PM - 04:45 PM

Seeking Information and Help for ADHD in the Modern Digital Era

Chair: Xin Zhao, University of Washington / Seattle Children's

Presenters:

Julie Schweitzer, University of California, Davis

Kevin Antshel, Syracuse University

Xin Zhao, University of Washington / Seattle Children's

Anthony Rostain, Cooper University Health Care

Overall Abstract: In an era where college students and young adults are "digital natives," the influence of digital tools such as social media, search engines, and artificial intelligence on health-related decisions is profound. This symposium presents current research on ADHD information needs, the impact of online misinformation, and the quality of AI-generated content in the realm of ADHD. Through a combination of experimental studies, qualitative analyses, and cross-sectional content evaluations, we explore the role of web-based platforms, social media, and AI in ADHD information seeking and decision-making.

Speaker 1 (J. Schweitzer) conducted qualitative analyses to identify the information needs and format preferences for web-based content among adults with or parents of children with attention-deficit/hyperactivity disorder. Data on whether parents and adults with an interest in ADHD showed an increase in their knowledge of ADHD facts after being exposed to two ADHD-related websites, including one developed with community input.

Speaker 2 (A. Schiros) conducted an experimental study to examine the impact of TikTok misinformation on college student ADHD knowledge and treatment seeking intentions. Factors of online misinformation that influence ADHD treatment seeking intentions will be discussed.

Speaker 3 (X. Zhao) will present analyses evaluating the quality, accuracy, and credibility of AI responses to ADHD-related questions asked on Quora. The session will also explore the benefits and limitations of using AI tools, such as ChatGPT and Gemini, for mental health information seeking.

Speaker 4 (A. Rostain), as the discussant, will integrate the findings from these diverse methodologies, discussing their implications for enhancing equity in access to ADHD information and care. The discussion will highlight policy and clinical implications and propose

future directions for improving the availability of science-based ADHD resources in the digital age.

Learning Objective 1: Identify and evaluate the unique ADHD information needs and preferences of digital natives, including adults with ADHD and parents of children with ADHD, and propose strategies for delivering ADHD-related content that aligns with these preferences.

Learning Objective 2: Participants should be able to analyze the practice implications of digital information and misinformation, particularly on platforms like TikTok and AI tools like ChatGPT.

Learning Objective 3: Participants should be able to discuss factors of online misinformation that influence ADHD treatment seeking intentions.

From Clicks to Knowledge: Exploring ADHD Information Seeking in the Digital World

Julie Schweitzer, University of California, Davis

Hypothesis/Objective: Attention-Deficit/Hyperactivity Disorder (ADHD), affecting 2-7% of children and 7% of adults, is a prevalent behavioral disorder with far-reaching impacts on individuals, families, and society. Unfortunately, it is often undertreated, leading to significant delays in initiating treatment. Controversy and stigma surrounding the diagnosis contribute to a reluctance to seek care, while gaps in knowledge about ADHD hinder access to effective treatments. Accurate and user-friendly web-based information on the disorder should help those seeking knowledge and may result in shortened delays toward evaluations and starting treatment.

The project involved two sub-projects working toward improving information on websites for ADHD: 1) A series of qualitative studies to identify the needs and preferences for gaining information for an ADHD website with community partners; 2) A quantitative study exploring media consumption habits regarding ADHD and knowledge of ADHD facts. Information on the strength of ADHD websites to improve knowledge of ADHD will also be presented.

1. To understand the needs and formatting preferences for an ADHD-focused website among individuals seeking information about ADHD online, including parents of children with ADHD and adults who may have ADHD

2. To understand the media consumption habits of parents and adults interested in ADHD;

3. To develop a website that informs and supports decision-making in ADHD care, guided by feedback from key partners

Methods: Study 1: A qualitative study to identify the needs and preferences for an ADHD-focused website. We conducted a 3-phase study using in-depth phone interviews, focus groups, and think-aloud interviews to critique and refine an ADHD website being developed using ADHD-partner information.

Study 2: A quantitative study involving two independent samples recruiting parents of children with suspected ADHD and adults with or suspected ADHD. A local sample of participants recruited via e-mail associated with a local support group and/or institute for neurodevelopment

with parent participation (n = 50) and adults interested in ADHD for themselves (n = 40); 2) Online national sample recruited through Amazon Mechanical Turk with parent interest on ADHD (n = 510) and adults interested in ADHD for themselves (n = 602). Study 2 assessed ADHD web media consumption, knowledge of ADHD and change in knowledge after reviewing ADHD websites (CHADD & UC Davis partner informed).

Results: Study 1: Participants were sophisticated in their knowledge and wanted information from evidence-based journals written in language for a lay audience. Regarding formatting, they had concerns about information being presented in a too distracting way and desired information to be presented with drop-down menus located at the top of, interactive designs and information presented via infographics and videos. Most adults requested that information be presented in a destigmatized way and the inclusion of positive, strength-based information on ADHD. Participants also requested information on how to find resources for evaluation and treatment.

Study 2: The local parent and adult participants devote about 4 hours per week looking for general health information on the web, whereas the MTurk parents report spend 10.4 and adults 7.2 hours per week. Both groups shared concerns about the accuracy of online ADHD information and expressed frustration during their searches. Despite the extended duration spent seeking information, a larger proportion of MTurk participants demonstrated incorrect responses to questions pertaining to the diagnosis, treatment, and symptoms of ADHD.

Conclusions: Parents and adults seeking information on ADHD expressed significant concerns about the validity and consistency of the information they found online and felt overwhelmed by the abundance of information on "new" treatments. Including community partners in the design of ADHD-related information ensures that both content and format are tailored to their needs. Our findings revealed a substantial knowledge gap regarding ADHD that high-quality web resources can help address. Collaborating with the community in website design is expected to improve public knowledge about ADHD, decision-making about when to seek ADHD evaluations, how to identify qualified evaluators, and reduce the time to start treatment.

Misinformation Mayhem: The Effects of TikTok Content on ADHD Knowledge and Treatment Seeking Intentions

Kevin Antshel, Syracuse University

Hypothesis/Objective: Attention Deficit/Hyperactivity Disorder (ADHD) content is increasingly popular among college students, especially on the social media platform TikTok. Despite the near ubiquity of TikTok use among college students and the high volume of ADHD content on the platform, TikTok frequently provides misinformation about ADHD. This ADHD misinformation is concerning because misinformation poses the risk of perpetuating ADHD stigma and trivialization and increasing the pursuit of ADHD treatment based off a false understanding of ADHD. This increased treatment-seeking behavior based off misinformation may be a contributor to the current problems of extensive waitlists for ADHD assessment and shortage of stimulant medication for ADHD. Given the recent surge in the quantity and popularity of TikTok ADHD content and the risks posed by misinformation, it is important to

understand the potential implications viewing this misinformation may have on ADHD knowledge, perceptions, and treatment-seeking intention.

Methods: An experimental study evaluated the effects of ADHD on treatment-naïve college students. A systematic content analysis was completed to identify common ADHD misinformation present on TikTok, and an iterative approach was utilized to develop ADHD TikTok content for this study. Participants (N=490) were randomly assigned to one of three conditions (accurate ADHD information, ADHD misinformation, control) to view TikTok content. Participants completed a baseline measure of ADHD knowledge prior to content viewing. Following content viewing, participants completed measures assessing their knowledge, perceptions, and treatment-seeking intentions related to ADHD.

Results: Participants exposed to ADHD misinformation exhibited significantly less accurate) ADHD knowledge, but higher confidence in their ADHD knowledge post-content viewing. Participants exposed to misinformation also reported the highest intentions to seek evidence-based and non-evidence-based treatment for ADHD

Conclusions: ADHD misinformation is abundant on social media. Evidence suggests that exposure to misinformation decreases ADHD knowledge, increases confidence in ADHD knowledge, and increases intentions to seek evidence-based and non-evidence-based treatments for ADHD. Measures to combat the spread of misinformation and increase access to accurate ADHD information are key.

ChatGPT and ADHD: Analyzing the Benefits and Limitations of AI in Seeking Mental Health Information

Xin Zhao, University of Washington/ Seattle Children's

Hypothesis/Objective: Parents and young adults increasingly turn to online sources for mental health information due to their convenience and accessibility. Recently, generative artificial intelligence-powered conversational agents, such as ChatGPT, have garnered significant attention from patients, clinicians, and researchers. While these digital tools offer potential benefits, they also pose risks of introducing biases and misinformation, which can be particularly harmful in mental health contexts. This study aims to assess the quality of information provided by ChatGPT in response to commonly asked questions about ADHD on Quora, a popular Q&A platform.

Methods: We identified 20 ADHD-related questions on Quora by searching for "ADHD" on 08/07/2024, with the search limited to posts from the past year. The selected questions had public follow counts ranging from 42 to 737 and view counts from 34K to 45.1M. The questions covered a wide range of topics, including diagnosis, treatment, lived experiences, functional impairments, long-term outcomes, and comorbidity with autism spectrum disorder. These questions were input into ChatGPT. The responses from ChatGPT were exported to an excel spreasheet and analyzed using rapid qualitative analyses.

Results: Quora questions covered a wide range of topics, including diagnosis ("What are the symptoms of ADHD in adults?"), treatment ("What is the best non-medication treatment for

ADHD and why?"), lived experiences ("What ADHD struggle do you find the most difficult to live with?"), functional impairments ("How is ADHD a disability?"), long-term outcomes ("Do people outgrow ADHD? Why or Why not?), and relations with autism spectrum disorder ("What's worse, ADHD or autism?"). ChatGPT provided useful information on ADHD symptoms and available treatment options. However, it struggled with critical thinking and clinical judgment, leading to challenges in extracting and conveying evidence-based information tailored to specific patient needs (e.g., treatment considerations for different age groups and presenting issues). For instance, in response to the question, "What are the remedies for Attention Deficit Disorder?" ChatGPT offered a broad array of options, including ADHD coaching, which has limited evidence of efficacy. Additional examples will be provided at the presentation.

Conclusions: Although ChatGPT is a powerful tool that is convenient and accessible and provides general and helpful information about ADHD symptoms, the quality of most ChatGPT-generated content exhibits similar issues to other online resources, such as information overload. As of August 2024, GPT-4o mini is not yet reliable enough for all direct-to-consumer ADHD queries, particularly those involving treatment selection and shared experience. ChatGPT is not a sufficient and reliable guide for users and professionals seeking accurate mental health information, especially around treatment and lived experience. Therefore, it is premature to conclude that ChatGPT is a safe and useful tool in mental health practice.

Discussant

Anthony Rostain, Cooper University Health Care

Description: Speaker 4 (A. Rostain), as the discussant, will integrate the findings from these diverse methodologies, discussing their implications for enhancing equity in access to ADHD information and care. The discussion will highlight policy and clinical implications and propose future directions for improving the availability of science-based ADHD resources in the digital age.

Why Is Sleep Such a Nightmare for Youth With ADHD, and What Can We Do About It?

03:15 PM - 04:45 PM

Why Is Sleep Such a Nightmare for Youth With ADHD, and What Can We Do About It?

Chair: Alison Pritchard, Kennedy Krieger Institute

Presenters:

Stephen Becker, Cincinnati Children's Hospital Medical Center

Saskia Van der Oord, KU Leuven

Alison Pritchard, Kennedy Krieger Institute

Erin Gonzalez, University of Washington School of Medicine

Overall Abstract: Youth with ADHD evidence well-established sleep differences that, in turn, contribute to their symptoms of ADHD and their day-to-day functioning. This symposium examines diverse aspects of sleep in youth with ADHD, with the goal of highlighting the complexities of the interplay between sleep and outcomes for these children. First, Dr. Becker presents a study of circadian phase preferences among adolescents, examining these preferences along with potential the confounds of sleep duration and sleep quality in a large sample of teens, half with ADHD. Dr. Becker's findings emphasize the importance of circadian preference, above and beyond other well-established sleep indices, for adolescents' performance and functioning. Next, Dr. Gonzalez presents an examination of school-aged children with ADHD's sleep habits and screen use during and after the COVID-19 pandemic, using both parent-report and accelerometer sleep-related data. While both sleep duration and screen use were greater during the pandemic than after, Dr. Gonzalez also finds that more screen use is associated with getting less sleep for children with ADHD. These findings suggest that both screens and scheduling may be potential targets for intervention. The following talk by Dr. Van der Oord highlights the utility of a novel CBT intervention for sleep (SIESTA) in improving sleep hygiene, sleep duration, and sleep-wake problem behaviors among teens with ADHD beyond treatment as usual. The effect on sleep hygiene persists at 4-month follow-up and an improvement in depression symptoms was also noted in those teens who completed SIESTA. Randomized controlled trials like this one offer critical support for clinical decision-making. Finally, Dr. Pritchard will provide an overview of a pilot trial of iron supplementation treatment for youth with ADHD and restless sleep. Despite the small sample, actigraphy-based, as well as self- and parent-report findings from this project offer an indication that iron supplementation may hold promise for improving both sleep and attention for these youth, and warrants larger-scale investigation. Taken together, the research presented in this symposium points to several fruitful points of intervention with regard to sleep in order to improve function for youth with ADHD.

Learning Objective 1: Explain the role of circadian phase preferences and screen use in sleep health and functioning for youth with ADHD, and assess the impact of these factors on daily functioning and treatment strategies.

Learning Objective 2: The participant will be able to compare and contrast which aspects of sleep and functioning are most impacted by cognitive-behavioral and iron supplementation treatments.

Learning Objective 3: The participant will be able to list 3 methods of intervention that have been demonstrated effective for sleep problems in youth with ADHD.

Later Circadian Preference is Associated With Poorer Executive, Academic, and Attentional Functioning in Adolescents With and Without ADHD

Stephen Becker, Cincinnati Children's Hospital Medical Center

Hypothesis/Objective: Adolescents vary considerably in their circadian phase preference; those with greater "eveningness" ("night owls") have later bedtimes, wake times, and peak arousal compared to those with greater "morningness." Prior research suggests that (a) greater eveningness is associated with worse academic, executive, and attentional functioning; and (b)

adolescents with ADHD tend to be high in eveningness and to have deficits in these school-related constructs. However, few studies have examined circadian preference alongside two potential confounds – sleep duration and sleep quality – as predictors of daytime functioning, or whether the strength of associations differs across adolescents with and without ADHD.

Methods: Participants were 302 adolescents (Mage=13.17 years; 44.7% female; 81.8% White); approximately half (52%) had ADHD. A multi-method, multi-informant design was used. Specifically, adolescents reported on their circadian preference, school night sleep duration, and sleep quality. Adolescents provided ratings of their academic motivation (intrinsic, extrinsic, and amotivation) and were administered standardized achievement tests in reading and math. Adolescents and parents completed ratings of daily life executive functioning (behavioral, emotion, and cognitive regulation), and they and teachers also provided ratings of ADHD inattentive symptoms.

Results: Above and beyond sleep duration, sleep quality, and covariates (sex, family income, pubertal development, medication use), greater eveningness was uniquely associated with poorer academic, executive, and attentional functioning across most measures. Sleep quality was uniquely associated with a handful of outcomes, and sleep duration was not significantly uniquely associated with any outcome in the regression analyses. ADHD status did not moderate effects.

Conclusions: This study provides evidence that greater eveningness may be more closely associated than sleep duration or quality with poorer academic, executive, and attentional functioning in adolescents. Targeting circadian preference may be important to reduce these problems in adolescents, especially in clinical samples such as ADHD for whom academic, executive, and attentional difficulties are exceptionally common.

Effectiveness of a Cognitive-Behavioral Sleep Intervention for Adolescents With ADHD: A Randomized Controlled Trial

Saskia Van der Oord, KU Leuven

Hypothesis/Objective: Sleep problems are highly prevalent in adolescents with ADHD, and highly impairing in their daily life. Although there are promising pilot studies of sleep focused interventions for adolescents with ADHD, there are no randomized controlled studies testing short and longer term effects. This study investigates the short term and longer term (4 months follow-up) effectiveness of a newly developed CBT sleep intervention for adolescents with ADHD – Sleep IntervEntion as Symptom Treatment for ADHD (SIESTA) next to treatment as usual for their ADHD as compared to treatment as usual only on sleep outcomes, but also on other outcomes (i.e. ADHD, depressive, anxiety, ODD symptoms, homework problems, parent-child conflict).

Methods: Adolescents with ADHD and sleep problems (N = 92, Mage = 14.36, SD = 1.43, 47% males) were randomized to receive SIESTA next to their treatment as usual for ADHD (SIESTA) or their treatment as usual only (TAU). SIESTA consists of seven weekly individual sessions with adolescents and two with caregivers. Adolescents work on their individual sleep

goal during the training. SIESTA includes motivational interviewing, psychoeducation about sleep, training of adequate sleep hygiene and relaxation techniques. Additionally a different module (motivation/ circadian rhythm / rumination/planning and organization) is followed depending on the individual sleep goal of the adolescent. Adolescent and parent ratings, actigraphy and sleep diaries, were collected at pre-test, after the intervention (post-test), and at 4 months follow-up. A linear mixed effects model was used with an intent-to-treat approach.

Results: Results show significant improvement in the SIESTA group compared to the control group from pre-test to post-test on sleep hygiene, chronic sleep reduction, and sleep-wake problem behaviors, all with medium to large effects, indicating clinically relevant effects of SIESTA on subjective experience of sleep. Actigraphy and sleep diaries showed no significant differences between groups, with both groups improving on sleep diaries, potentially indicating a sleep monitoring effect. The improvements in sleep hygiene were maintained at follow-up. Additionally depressive symptoms significantly improved more in SIESTA than in the control group (medium effects), but not on other outcomes.

Conclusions: In conclusion, this RCT shows indicates that SIESTA next to treatment as usual for ADHD effectively improved sleep hygiene and the perception of sleep problems as compared to treatment as usual for their ADHD only. Specifically, adolescents who received SIESTA reported improved sleep hygiene, with a remaining effect at four month follow-up, reported less chronic sleep deprivation, less sleep-wake problem behaviors, and less depressive symptoms compared to those who continued their treatment as usual for ADHD. Moreover, both adolescents and their caregivers were generally satisfied with SIESTA and no harms were reported. While the results provide promising evidence for the effectiveness of SIESTA on the short term, booster sessions or integration into a larger treatment management plan seem advised to maintain these effects. Further, It is important to clinically recognize the intricate interplay between sleep and symptoms of depression in adolescents with ADHD, given the high comorbidity and improvement in depression after our sleep intervention. Second, ADHD can be a lifelong condition requiring sustained management strategies, therefore we would suggest during the management of ADHD to be mindful for sleep problems and if necessary integrate SIESTA into comprehensive ADHD treatment plans.

The Young & The Restless: A Pilot Study of Iron Supplementation Treatment for Youth With ADHD and Restless Sleep

Alison Pritchard, Kennedy Krieger Institute

Hypothesis/Objective: Sleep concerns are common among youth with ADHD and range from difficulty falling asleep and staying asleep to restlessness during sleep. Iron supplementation is an established treatment for Restless Legs Syndrome in adults that may also hold promise for improving sleep among youth with ADHD. The objective of this pilot study is to evaluate the effect of iron supplementation treatment on sleep and attention among youth with ADHD and sleep difficulties.

Methods: Nine youth (7 female) ages 11 to 16 (Mage=13.48) with ADHD, parent- or self-reported restlessness during sleep, and ferritin < 50ng/mL, completed 3 months of iron supplementation treatment. Pre- and post-treatment, parents rated sleep disturbance and ADHD symptoms; while youth rated their own restlessness during sleep, completed performance-based attention measures, and wore ankle actigraphy monitors for 5 nights.

Results: Despite the small sample size, marginally significant improvements with treatment were found in parents' ratings of sleep disturbance ($t(8)=2.135$, $p=.033$) and hyperactive/impulsive symptoms ($t(8)=1.835$, $p=.052$), as well as significant improvements in inattentive ($t(8)=2.683$, $p=.014$) and total ADHD symptoms ($t(8)=2.543$, $p=.017$). Self-rated restlessness improved significantly as well ($t(8)=1.890$, $p=.048$). Furthermore, a significant positive effect of treatment on Conners Continuous Performance Task Variability scores ($t(8)=2.595$, $p=.016$) was found, as was a marginally significant positive effect of treatment on arousals during the night ($t(8)=1.710$, $p=.063$) and on periodic leg movements of sleep associated with arousals ($t(8)=1.826$, $p=.053$), both measured by actigraphy.

Conclusions: Findings of this pilot study suggest that further investigation of iron supplementation treatment is warranted, given its potential for meaningful benefits in terms of both sleep and attention for youth with ADHD.

Sleep, Screens and Shutdowns: Child Health Behaviors and ADHD Symptoms During and After the Pandemic

Erin Gonzalez, University of Washington School of Medicine

Hypothesis/Objective: ADHD is associated with sleep disruption (Konofal, Lecendreux & Cortese, 2010), which in turn worsens ADHD symptoms and functioning (Haverkamp et al., 2020). Sleep problems have also been connected with evening screen use (Cavalli et al., 2021). This study examines relations between child sleep duration and problems, screen use and ADHD symptoms during and post-COVID-19 pandemic.

Methods: Children ages 6-10 with ADHD were recruited from specialty clinics and primary care between fall 2020 and summer 2022. Average sleep duration was measured via waist-worn accelerometer across 1 week. (Barreira et al., 2015; Tudor-Locke et al., 2015). Parents completed the Children's Sleep Habits Questionnaire and Conners Parent Rating Scale-3 and reported their child's average weekday screen use and related behaviors. Meeting American Academy of Pediatrics (AAP) guidelines was defined as sleeping >9 hours and spending <2 hours on screens daily.

Results: Data was collected for 93 children (M age = 8.10, SD = 1.37;); with ADHD (24.5% Inattentive subtype; 62.8% Combined subtype); 58.9% were male; 24.3% were Black, Indigenous, or children of color). A total of 69 children completed accelerometer wears.

TheySleep averaged 9.65 hours/day of sleep (SD=1.58 hours), but only 46% met sleep guidelines (range: 6.13-13.76 hours). Compared to post-pandemic (Fall 2021-Spring 2022), children were more likely to meet sleep guidelines (Odds Ratio = 2.33, $p=.033$) and spend more hours on screens ($p=.043$) during pandemic shutdowns (Fall 2020-Spring 2021). Meeting sleep guidelines

was associated with less daytime sleepiness (B = -2.94, SE = 0.78, p< .001). Those who met screentime guidelines had less bedtime resistance (B=-2.79, SE=0.96, p=.005), sleep disturbance (p=.037), parasomnias (p=.014) and bedtime resistance (p=.003). Meeting sleep or screen guidelines was not associated with ADHD symptom severity.

Conclusions: Children with ADHD slept more and had more screen time during the pandemic. Children with poorer sleep spent more time on screens. Understanding the relationship between poor sleep and screen use can guide health interventions for children with ADHD.

Presidential Address & Past Presidents Travel Award Presentation

5:00 PM – 5:30 PM

ADHD and the Era of Social Media

05:30 PM - 06:30 PM

ADHD and the Era of Social Media

Chair: Steven Pliszka, UT Health Science Center at San Antonio

Presenters:

Meredith Gansner, Harvard University

Samson Nivins, Karolinska Institutet

Overall Abstract: There has been extensive discussion in both the lay and scientific media regarding the possible negative effects of social media on youth development. What roles does excess social media use play in the development of depression and/or ADHD? What are the effects of social media on brain development?

Learning Objective 1: To reviewe the current literature on the effects of social media on youth development, depression.

Learning Objective 2: Understand the possible effect of social media use on brain development.

Learning Objective 3: Development evidence-based recommendations for parents and children regarding the use of minors' internet and social media usage.

Youth With ADHD and Their Complicated Relationship With Social Media

Meredith Gansner, Harvard University

Hypothesis/Objective: Nearly a third of youth start using social media before the age of 13, with time spent on social media alone often exceeding two hours per day. While social media use may be a low-risk activity for many adolescents, there are growing concerns about its propensity to cause psychiatric illness, including ADHD-related symptoms. This talk summarizes existing evidence-based research surrounding the relationship between social media use and adolescent inattention and impulsivity, specifically reviewing:

Methods: 1) Varying mechanisms proposed to explain an apparent linkage between media exposures and ADHD-related symptoms/behaviors

2) How social media platforms are designed to enable inattentive and impulsive behaviors

3) Type of high-risk social media use which may be more prevalent among youth with ADHD diagnoses

Results: The question of whether media can cause ADHD-related symptoms and behaviors is not a new one; it predates the rise of social media platforms. However, the debate has been reignited due to both the ubiquity of these platforms as well as their marked popularity among youth. While research remains inconclusive regarding social media's ability to cause inattention or impulsivity, there is evidence that social media platforms may encourage these behaviors.

Conclusions: For these reasons, teens with ADHD may be at greater risk of engaging in dangerous social media behaviors (e.g. online challenges or excessive social media use). Thus, it is critical for clinicians to screen for high-risk social media use in pediatric patients with ADHD, as well as encourage development of these patients' digital media literacy skills.

The Cost of Constant Connection: How Social Media Shapes Young Minds

Samson Nivins, Karolinska Institutet

Hypothesis/Objective: Since the COVID-19 global pandemic, digital media usage, particularly social media use among school-aged children, has increased, rising from 149 to 199 minutes per day. While prior studies often group various digital activities such as social media, video gaming, and watching television, under the broad term 'Digital Media' these activities can affect children's development and behavior in different ways. We studied long-term effects of individual digital media use (i.e., social media use, video gaming, and watching television) on brain development and ADHD symptoms in school-aged children.

Methods: We used data from a prospective, multicenter, longitudinal cohort of U.S. children from the Adolescent Brain and Cognitive Development Study, aged 9.9 years at entry, for four years. Annually, children completed the Youth Screen Time Survey, answering questions about the estimated time spent on screen time usage during weekdays and weekends. ADHD symptoms were assessed via the parent-reported Child Behavior Checklist, and brain MRI scans were conducted every two years.

Results: We found that heavy social media use was associated altered developmental trajectory, resulting in smaller cerebellum volumes after four years. Heavy social media use was also associated with increased inattention symptoms over time. This observed effect was not altered by sex, ADHD diagnosis or medication status. In contrast, playing video games and watching television/videos did not show these effects.

Conclusions: Constant distractions and frequent shifts in task stimuli during social media use might be a key contributing factor to reduced cerebellum and increased inattention symptoms. Given the cerebellum's role in various psychiatric disorders and its critical development phase, our findings raise concerns about extensive social media use among children.

SUNDAY, JANUARY 19, 2025

Clinical Roundtable: ADHD Treatment and Hormones across the Lifespan in Women

8:00 AM – 9:30 AM

Chair:

Presenters:

Chair: Julia Schechter, Duke University Medical Center and Karen Saporito, Integrative Associates of South Jersey

Presenters:

Ritika Baweja, Penn State University College of Medicine

J. J. Sandra Kooij, PsyQ, Program Adult ADHD, The Hague

Lotta Borg Skoglund, Uppsala University, Sweden; Karolinska Institutet, Sweden

Jeremy Dider, CHADD

Overall Abstract:

Cognitive-Behavioral Intervention to Treat Executive Dysfunction in College Students With ADHD

08:00 AM - 09:30 AM

Cognitive-Behavioral Intervention to Treat Executive Dysfunction in College Students With ADHD

Chair: Mary Solanto, Hofstra-Northwell School of Medicine

Presenters:

Mary Solanto, Hofstra-Northwell School of Medicine

Anthony Rostain, Cooper University Health Care

Sarah O'Neill, The City College of New York

Overall Abstract: Students with ADHD experience significant difficulties when they begin college, including: challenges for independent functioning, without the support and scaffolding they received from parents and teachers in high school; and new temptations and distractions – e.g. to use substances, go off their medication and to take other risks with regard to self-care. Furthermore, most have not internalized the executive function strategies needed to succeed in college. It is not surprising, therefore, that students with ADHD, who constitute 4% of college students, achieve lower GPAs, complete fewer credits, and are more likely to drop out or fail out of college.

Our goal therefore was to develop an effective intervention, now rarely available on college campuses, that can be administered by college counseling center personnel. Derived from our successful program for adults with ADHD, the intervention is delivered in a small-group format, which is cost-effective and provides unique benefits with respect to destigmatization, mutual support, and positive modelling. The NIMH-supported pilot study to be described was conducted at the City College of New York, a component of the public City University of New York, with the aims of revising and refining the intervention in order to improve outcomes, as well as developing a treatment manual for clinicians.

Dr. Solanto will begin by describing the structure and components of the intervention. She will present the outcome of this open trial with 30 students, with respect to core ADHD symptoms, executive functions, as well as student ratings of the helpfulness of the program process and strategies.

Dr. Rostain will discuss the students' ratings of the helpfulness of each of the program strategies and their relationship to the impact of the intervention as a whole on metacognitive abilities and attitude toward school.

Dr. O'Neill will describe the challenges of conducting this work with a historically marginalized population of college students and consider the relationships between these demographic variables and the students' evaluation and treatment history and their ratings of the helpfulness of the intervention.

Learning Objective 1: To make the case for the need to provide skills training to develop executive functions in college students with ADHD.

Learning Objective 2: To elucidate the helpfulness and mechanisms of action of the strategies employed in skills training of executive functions.

Learning Objective 3: To illustrate the program adaptations necessary for addressing comorbid conditions in college students with ADHD.

Treatment Description and Rationale

Mary Solanto, Hofstra-Northwell School of Medicine

Hypothesis/Objective: College students with ADHD, who constitute approximately 4% of students on US campuses [1], experience significant academic impairment, evident in findings that they withdraw from more college courses[2], have lower GPAs[3], are more likely to be placed on academic probation[1], and are less likely to graduate from college[4]. Poor executive function is recognized as a central characteristic of ADHD and has been shown to be a strong concurrent predictor of impairment in academic performance in children and adolescents with ADHD. Most recently, better executive function was associated with improved academic outcomes in college students with ADHD [5]. The purpose of this study, therefore, was to revise and refine our previously piloted cognitive-behavioral group intervention aimed at enhancing executive function in college students with ADHD, as well as to develop a program to train college counselors to deliver the intervention. For maximum accessibility and benefit, it is

important that the intervention be available in campus counseling centers. A longer-term goal of this project, therefore, is to develop a training program for campus counselors to deliver the intervention.

REFERENCES:

1. Heiligenstein, E., etal., Preliminary normative data on DSM-IV attention deficit hyperactivity disorder in college students. Journal of American College Health, 1998. 46: p. 185-188.

2. Advokat, C., etal., College students with and without ADHD: comparison of self-report of medication usage, study habits, and academic achievement. J Atten Disord, 2011. 15(8): p. 656-66.

3. Blase, S.L., et al., Self-reported ADHD and adjustment in college: cross-sectional and longitudinal findings. J Atten Disord, 2009. 13(3): p. 297-309.

4. Barkley, R.A., etal., Young adult outcome of hyperactive children: Adaptive functioning in major life areas. J Amer Acad Child Adolescent Psychiatry, 2006. 45: p. 192-202.

5. DuPaul, G.J., etal., Academic Trajectories of College Students with and without ADHD. J Clin Child Adolesc Psychol, 2021: p. 1-16.

Methods: This intervention includes strategies to address time-management, prioritization, and planning, and to overcome distractibility, procrastination, and the irrational automatic thoughts which derail the deployment and maintenance of these skills. Also included were academically focused strategies to improve retention of reading material and organization and writing of academic papers. Sessions were led by the Principal Investigator, along with one of the three college-based psychologists undergoing training to deliver the program. Trainees received pre-group didactics concerning ADHD in Adults, as well as weekly supervision based on the session-by-session protocol initially developed for the pilot study (Netherlands) and iteratively revised in the course of the current project. In addition, they met with the 3 Study Investigators weekly to review the content and process of the Group sessions of that week, reinforce effective practices, and suggest improvements as needed.

Outcomes were assessed by the following: Pre- to post-treatment change in the number and severity of the core DSM-5 ADHD Inattentive symptoms, assessed by the trained investigators on the Adult ADHD Investigator Symptom Rating Scale (AISRS), a structured diagnostic interview of DSM-5 symptoms, each of which each symptom is rated in severity from 0 to 3. Self-report was obtained on the CAARS (Conners Adult ADHD Rating Scale). Executive skills were assessed on the self-reported BRIEF-A. Students rated the Helpfulness of each of the program modules and strategies on a scale of 0 to 3.

Results: We have thus far completed treatment for 5 of 6 group cohorts planned for the study, which was conducted at a public, urban college, and will be completed during the Fall semester of 2024. Each cohort averaged 6 students, totaling 32 students. The sample was diverse, with respect to gender (75% female) and race (34% Black, 28% White, 22% Asian, 6% American

Indian/Alaskan Native, 9% Unknown/preferred not to say). Twenty-four students (75%) completed at least 9 of the 12 sessions.

Significant pre-post treatment improvement for "completers" was noted on the AISRS with respect to endorsement of the 9 DSM-5 Inattentive symptoms, decreasing from 7.61 to 4.87 [F (1,22) = 27.42, p<.001) ES=0.59]. Severity (ratings summed across the 9 symptoms) decreased from 19.82 to 14.41 [F (1,21) =30.08, p<.001, ES=0.56]. At end of treatment, 8 students (33%) no longer met criteria for ADHD. On the CAARS, the T-score for Total DSM-5 ADHD Symptoms decreased from 79.92 to 71.46 [F (1, 23) = 8.50, p=.008, ES=0.27]. The mean T-score on the BRIEF-A Metacognitive Index decreased (improved) from 77.13 to 69.43 [F(1,22) = 13.60, p=.001, ES=.38].

Completers rated the "Helpfulness" of program components on a scale from 0 to 3, ranging from:

"Not at all" (0), "A Little" (1), "Moderately" (2) to "Very Helpful" (3).

Mean Helpfulness ratings were as follows with respect to:

• Increasing self-acceptance: Mean = 2.60, SD = 0.57.

• Increasing motivation to overcome difficulties associated with ADHD: Mean = 2.77, SD = 0.43.

• Helpfulness of the Group Process (listening and sharing): 2.92 (SD=0.27).

• Overall helpfulness of the program: Mean = 2.59, SD = 0.57.

Results of supervision of the counselor-trainees will continue to be incorporated into iterative revisions of the treatment protocol, and will ultimately contribute to the development of a training manual for campus counselors.

Conclusions: The results presented here thus far provide support for the feasibility, acceptability, and effectiveness of the intervention vis-à-vis inattentive ADHD symptoms and executive functions in college students with ADHD. As such, they warrant assessment of efficacy on a larger scale in a randomized controlled trial against an active control (support) condition.

Impact of Strategies Learned by ADHD College Students During CBT Intervention on Metacognition, and on Attitude and Motivation Toward Academics

Anthony Rostain, Cooper University Health Care

Hypothesis/Objective: This presentation aims to clarify how strategies taught in a CBT-based intervention for college students with ADHD impacted participants' executive functioning, attitude toward academics and motivation to complete schoolwork.

Methods: N=24 participants (Mean = 21.82, SD = 2.82 years) "completed" the 12-week intervention (i.e., attended ≥9 sessions for ≥ 1 hour). (Note: analyses limited to individuals who completed the intervention).

Pre and post intervention, participants completed the BRIEF-A to assess executive functioning, as well as the LASSI-III to assess use of learning and study strategies. Three dependent variables were used in these analyses: the Metacognition Index of the Brief, and two subscales of the LASSI-III (Attitude and Motivation).

The Metacognition Index (MCI) of the BRIEF-A reflects the individual's ability to initiate activity and generate problem-solving ideas, to sustain working memory, to plan and organize problem-solving approaches, to monitor success and failure in problem solving, and to organize one's materials and environment.

The LASSI-III Attitude (ATT) subscale measures participants' interest in academic success and perceptions of the relevance of college, while the Motivation (MOT) subscale assesses diligence, self-discipline, and willingness to exert the effort necessary to successfully complete academic requirements. These specific LASSI-III subscales were chosen because there is an affective/motivational component to each, which we hypothesized would be related to students' academic difficulties stemming from inattention and executive dysfunction.

At completion of the 12-week intervention, participants rated the helpfulness of each of the 11 strategies that they had learned during the intervention on a scale from 0 (Not At All Helpful) to 3 (Very Helpful). Helpfulness ratings for each strategy were averaged across all participants and seven strategies achieved a mean rating ≥2 ("Moderately Helpful"): Chunking, Planner Use, Prioritization, Identification of Negative Automatic Thoughts, Challenging Automatic Thoughts, Winding Down Before Bedtime, and Self-Reward After Completing Difficult/Unpleasant Task (see Table 1). Helpfulness scores for these seven strategies were averaged to create a single variable, Strategy Composite (Mean = 2.20, SD = 0.47).

Results: Data Analysis:

One-way repeated ANOVAs were carried out to determine if executive functioning, attitude and motivation changed following treatment.

To determine if strategies that students learned throughout the intervention were related to change in each domain, three linear regression analyses were carried out. The post-treatment rating was regressed on the pre-treatment rating and mean helpfulness of the Strategy Composite.

Given the small sample size, linear regression analyses were conducted with a bootstrapping procedure. The bootstrapping approach draws multiple, random samples from the data set (using sampling with replacement) and measures the coefficients for each sample.

Results:

Change in each domain was observed from pre to post treatment: MCI (Pre: Mean (SD) = 77.13 (7.42), Post: Mean (SD) = 69.43 (10.14)), ATT (Pre: Mean (SD) = 23.38 (15.79), Post: Mean (SD) = 31.75 (20.81)) and MOT (Pre: Mean (SD) = 7.25 (13.60), Post: Mean (SD) = 17.88 (24.53)) showed positive changes.

Furthermore, one-way repeated measures ANOVAs showed this improvement to be significant: MCI, $F(1, 22) = 13.60$, $p = .001$, ES = .38, ATT, $F(1, 23) = 5.04$, $p = .035$, ES = .18, and MOT, $F(1, 23) = 9.77$, $p = .005$, ES = .30.

Linear regression analyses with bootstrapping showed that the Strategy Composite learned during the intervention was significantly related to post-treatment MCI (B= -7.01, SE = 2.48, 95% CI = -11.72, -1.73) and ATT (B=14.17, SE=6.49, 95% CI = 2.95, 31.58) over and above pre-treatment ratings. However, Strategy Composite was not related to post-treatment MOT after accounting for pre-treatment MOT (B=4.14, SE=5.38, 95% CI = -4.63, 9.64).

Conclusions: College students with ADHD who participated in a 12-week group CBT intervention learned a variety of strategies to cope with their executive functioning challenges. The most helpful of these strategies were Chunking, Planner Use, Prioritization, Identification of Negative Automatic Thoughts, Challenging Automatic Thoughts, Winding Down Before Bedtime, and Self-Reward After Completing Difficult/Unpleasant Task. Together, these strategies significantly improved participants' metacognitive abilities and attitude toward school. Future iterations of the CBT intervention will amplify these strategies.

ADHD Among Students Attending an Urban, Public College: Overcoming Challenges & Looking to the Future

Sarah O'Neill, The City College of New York

Hypothesis/Objective: College students with ADHD have poorer academic outcomes than non-ADHD peers (Weyandt et al., 2013) and are at greater risk for lower mood (Mohamed et al., 2021), highlighting the importance of identification of and treatment for ADHD. Yet many individuals with impairing inattention and/or hyperactivity/impulsivity have never been evaluated for ADHD reflecting the impact of myriad social determinants of health. For children and adults alike, disparities in ADHD assessment and treatment access have been observed across racial and ethnic groups (Adams et al., 2024; Fairman et al., 2017) and socioeconomic strata (Michaelsson et al., 2022). Understanding barriers to engagement with services for college students is essential for achieving health equity.

The current presentation has three aims: (1) to identify the most common reasons students were excluded from taking part in a group CBT intervention for executive dysfunction; (2) to examine demographic factors (i.e., gender, race/ethnicity, immigration history) related to ADHD severity and heath service access; and (3) highlight the benefits of a group intervention for students attending an urban, public, college.

Methods: Undergraduate and Master's students attending The City College of New York (CCNY) were recruited into a group CBT intervention for executive dysfunction in ADHD. CCNY is an urban, 4-year public college, which has maintained its founding mission to provide low-cost higher education to individuals irrespective of their identity or socioeconomic circumstances. CCNY's current student body is ethnically and racially diverse (84% are students of color); 53% of students are female, and 44% were born in a country other than the United States.

Students interested in joining the study were initially screened, and reasons for ineligibility were documented. During this screening call, students self-reported their assigned sex at birth, gender, race, ethnicity, and city and country of birth. In addition, they described any prior evaluations for ADHD, as well as lifetime and current ADHD medication use. Students who passed the telephone screen completed a comprehensive evaluation for ADHD, comprising questionnaires and semi-structured interviews (i.e., ACDS for childhood symptoms and AISRS for adult symptoms). Eligible students were able to join the group intervention. Students who completed the group rated Helpfulness of the program on a 4-point Likert scale (0 = Not At All; 3 = Very Much).

N=175 students completed a telephone screen; n=32 students met all eligibility criteria and enrolled in one of the treatment groups. Most students identified as a cis-gender woman (n=24, 75%); one third identified as Latine (n=11, 34%); the sample was racially diverse (n=2, 6% American Indian/Alaska Native; n=7, 22% Asian; n=11, 34% Black; n=9, 28% White; and n=3, 9% preferred not to say); and over one third (n=12, 38%) of participants were first generation immigrants to the United States. Thus, our sample's racial/ethnic composition and their immigration histories was similar to the CCNY population, with the exception of our sample comprising a higher proportion of women.

Results: N=175 individuals were screened and over half (n=95, 54%) met one or more exclusion criteria. The most common reasons for exclusion were suicidal ideation (n=46, 48%), lifetime suicide attempt (n=14, 15%), and hazardous substance use, primarily cannabis (n=12, 13%).

Nearly three quarters (n=23, 72%) of participants who enrolled in a group had no prior history of evaluation for ADHD. Evaluation history differed by racial and ethnic identity. White Non-Latine students (n=5, 71%) were more likely than Students of Color (n=4, 16%) to have received a prior ADHD evaluation, $\chi^2(1)=8.31$, $p=.004$, ES=.51. In addition, these same five White Non-Latine students had taken medicine to help manage their symptoms at some time point compared to only two Students of Color, $\chi^2(1)=12.87$, $p<.001$, ES=.63. Only three of the 32 students were currently taking medicine for ADHD, of whom 2 (67%) were White Non-Latine, $\chi^2(1)=3.89$, $p=.049$, ES=.35. Yet there was no difference in number of childhood or adult ADHD symptoms as a function of Race/Ethnicity, $F(2, 29)=1.29$, $p=0.29$, Pillai's trace=0.08, ES=0.08. Gender and immigration history were not associated with ADHD evaluation or treatment history, or childhood or adult ADHD symptom count (all $p>.05$).

For students who did complete the intervention, the group format was well appreciated. Students considered that Sharing My Own Progress and Concerns (Mean=3.00, SD=0.00), Hearing Others Speak About Their Concerns and Progress (Mean=2.89, SD=0.33) and General Social Support of Group Members (Mean=2.89, SD=0.33) was Moderately-to-Very Helpful. The group was Moderately-to-Very Helpful in increasing self-acceptance (Mean=2.60, SD=0.57); for one quarter of students (n=8), "Self-Acceptance" was the single greatest change they experienced following the group. None of these findings differed by Race/Ethnicity, Immigration History, or ADHD Evaluation History (all $p>.05$). However, men (Mean=2.60, SD=0.55) rated Sharing My Own Progress and Concerns as less Helpful than women (Mean=2.95, SD=0.22), $F(1, 24)=5.59$, $p=.026$, ES=.19.

Conclusions: Students were interested in the group program, but high rates of comorbid emotional and behavioral difficulties precluded involvement in the study. As reported by others, ADHD is a developmental risk factor for depression and suicidal behavior (Chronis-Tuscano et al, 2010). The high rate of suicidal ideation seen among students is a cause of concern for administrators and college counselors and should be addressed.

Disparities in health care access were evident among our students, with White Non-Latine students more likely to have had an evaluation for ADHD and to have taken medication for ADHD prior to our program than Students of Color. Aside from the negative long-term consequences of lack of identification and treatment of ADHD behaviors on academic outcomes (Arnold et al., 2015), this may have implications for students' understanding of ADHD, their openness to receiving the diagnosis, and grief that their concerns were (dis)missed for so many years. These issues require much more investigation in empirical research, as well as thoughtful navigation by clinicians.

Systemic issues impacting health care access in the community and stigma within families likely contribute to students' having not received any help for their difficulties prior to college. Thus, higher education provides a unique context for low-cost intervention delivery for students with ADHD. The group format, where individuals can be with and learn from their peers, may offer a framework for treatment that is acceptable and beneficial to participants.

Emotional Dysregulation in ADHD: Identification, Measurement, and Clinical Implications

08:00 AM - 09:30 AM

Emotional Dysregulation in ADHD: Identification, Measurement, and Clinical Implications

Chair: An-Katrien Hulsbosch, Okinawa Institute Of Science and Technology (OIST) Japan

Presenters:

An-Katrien Hulsbosch, Okinawa Institute Of Science and Technology (OIST) Japan

Melissa Aguiar, Florida International University

Alexis Garcia, Medical University of South Carolina

Overall Abstract:

Emotional dysregulation is increasingly shown to be present in children with attention-deficit/hyperactivity disorder (ADHD). Compared to their typically developing (TD) peers, children with ADHD show more intense negative and positive emotions, show increased levels of emotional lability, and are more reactive to frustrating and stressful situations. Current research on emotional lability in children with ADHD is typified by single measurement methods, often limited to parent and/or teacher report. The importance of including multiple measurement modalities is increasingly recognized, combining parent- and/or teacher report with behavioral and physiological measures of emotional reactivity and dysregulation. This

symposium highlights recent research on emotional dysregulation, implementing multimodal assessment across different samples. Each presentation covers an important, but under investigated aspect of emotional dysregulation in children with ADHD and their families. In the first presentation, Dr. Hulsbosch provides data on emotional responding in children with ADHD, compared to TD children, in the context of experimental tasks assessing reinforcement and punishment sensitivity. She describes the relationship amongst different measurement methods of emotional responding, and how this emotional responding relates to task performance. In the next presentation, Ms. Hernandez provides an overview of specific domains of emotion dysregulation in children with ADHD, children with ADHD and comorbid conduct problems, and TD children. Using a comprehensive assessment battery, she provides an overview of how these domains are uniquely associated with the diagnostic classifications of these groups. Finally, Prof. Garcia extends the domain of emotion dysregulation to mothers of children with and without ADHD, using a multimodal assessment approach. In her presentation, she describes four distinct emotion regulation profiles, highlighting the heterogeneity of maternal emotion dysregulation. Additionally, she describes factors that are significantly related to emotion regulation. Together, these presentations will show the complexity of emotional dysregulation in children with ADHD and their families, highlighting the importance of multimodal assessment strategies, as well as the clinical importance of emotional dysregulation in ADHD.

Learning Objective 1: The participant will learn to Identify and evaluate the key components of multimodal assessment for emotion dysregulation in children with ADHD and their families, and apply this knowledge in case-based scenarios.

Learning Objective 2: The participant will be able to explain the diagnostic and clinical significance of emotion dysregulation in children with ADHD and their families, and assess its impact on treatment planning and outcomes.

Learning Objective 3: Analyze the differences in emotional reactivity to reinforcement and punishment between children with ADHD.

Emotional Responding to Reinforcement and Punishment in Children With ADHD: Responding Across Multiple Experimental Tasks and Measurement Methods

An-Katrien Hulsbosch, Okinawa Institute Of Science and Technology (OIST) Japan

Hypothesis/Objective: Altered processing of reinforcement and punishment is proposed to contribute to ADHD symptom development, with both altered behavioral and emotional responding assumed. Traditionally, reinforcement-based research has focused on behavioral responding, with emotional responses receiving limited attention. However, research increasingly shows overall heightened emotional responding in children with ADHD compared to typically developing (TD) children, for both positive and negative emotions. This general increase in emotional responding supports the importance of investigating emotional reactivity to reinforcement and punishment in children with and without ADHD.

Methods: Children with and without ADHD completed three tasks measuring reinforcement and punishment sensitivity: (1) an instrumental learning task, completed under continuous and partial

reinforcement, followed by an extinction phase (ADHD n = 84, TD n = 83); (2) a conditional discrimination learning task with and without a delay between the cue and response stimulus (ADHD n = 53, TD n = 49); and (3) a response allocation task investigating the effects of punishment and reinforcement on responding (ADHD n = 53, TD n = 46). As children completed the tasks, their facial expressions, and physiological responses (i.e., heart rate variability as an indicator of emotionality) were recorded. Parents also rated their children's emotional lability in daily life via a questionnaire. For all three tasks, the ADHD and TD groups were compared on the different measures of emotional responding, and on parent-rated emotional lability. The relationship amongst the different measures of emotional reactivity and lability will also be investigated, as well as their relationship with task performance measures.

Results: Children with ADHD showed increased negative facial expressions compared to TD children across tasks, together with more positive facial expressions during the response allocation task. Emotional responding was related to task performance for some, but not all, reinforcement sensitivity tasks. Results of the parent-report questionnaire showed increased emotional lability in children with ADHD compared to TD children. Physiological data is currently being processed for analyses. A final integration across these different measurement methods (facial expressions, physiological responding, and parent questionnaire) will be presented.

Conclusions: Our findings suggest children with ADHD show increased emotional responding under conditions of both punishment and reward, directly related to task performance for some of the experimental tasks. In addition, increased emotional lability in daily life is reported by the parents of children with ADHD compared to TD children. These preliminary results support increased emotional responding in children with ADHD compared to TD children across multiple measurement methods and reinforcement tasks.

Multimodal Assessment of Emotion Dysregulation in Children With and Without ADHD and Comorbid Conduct Problems

Melissa Aguiar, Florida International University

Hypothesis/Objective: Attention-deficit/hyperactivity disorder (ADHD) is a neurodevelopmental disorder which is associated with impairments across various functional domains, including social functioning, academic performance, and familial interactions. Given the chronic course and pervasive consequences associated with ADHD, it is imperative to identify early childhood indicators, or mechanisms underlying ADHD in order to develop better screening and preventative tools. One such potential mechanism, is emotion dysregulation. Considering a large percentage of young children with ADHD also exhibit comorbid conduct problems (CP), such as oppositional defiance disorder and conduct disorder, it is crucial to understand not just the association between emotion dysregulation and ADHD, but also between emotion dysregulation and CPs, and whether this hypothesized association may help explain the heterogeneity of emotion dysregulation difficulties in young children with ADHD. Therefore, the current study sought to explore if specific domains of emotion dysregulation (emotion regulation

[EREG], emotional reactivity/lability [EREL], emotion recognition/understanding [ERU], and callous-unemotional [CU] behaviors) were uniquely associated with diagnostic classifications.

Methods: This study utilized a multimodal (parent/teacher [P/T] reports and behavioral observations) approach to examine ED in a sample of young children (68.7% boys; mean age = 5.47, SD = 0.77, 81.4% Latinx) with attention-deficit/hyperactivity disorder (ADHD Only; n = 46), ADHD + conduct problems (ADHD+CP; n = 129), and typically developing (TD) children (n = 148). Within a general linear model framework, multivariate analyses of covariance (MANCOVA) and follow-up ANCOVAs were conducted to examine if there were significant differences across the three diagnostic groups on domains of ED. These analyses covaried for relevant demographic variables (i.e., age and sex), internalizing problems, and cognitive functioning. Lastly, two sets of multinomial logistic regression analyses were used to examine which domains of ED predict diagnostic status. Domains of ED that were significantly different across diagnostic groups were entered into the multinomial logistic regression analyses along with relevant demographic variables as predictors of group membership.

Results: All three diagnostic groups were significantly different from one another on P/T reports of EREG, EREL and CU. For the ADHD+CP group, P/T reported worse EREG and EREL, and higher mean scores of CU, compared to both ADHD Only and TD groups. The ADHD+CP group also performed significantly worse than the TD group (but not the ADHD Only group) on observed measures of EREG, EREL and ERU. P/T reported EREG, EREL and CU for the ADHD Only group were significantly worse than the TD group. Using multinomial logistic regression, P/T reported EREG, EREL, and CU were significantly associated with diagnostic status above and beyond observed measures of ED. The model successfully classified children with ADHD+CP (91.3%) and TD (95.9%); however, children in the ADHD Only group were correctly identified only 45.7% of time.

Conclusions: Our findings suggest that measures of emotion dysregulation may be particularly helpful in correctly identifying children with ADHD+CP, but not necessarily children with ADHD Only.

Examining Maternal Emotion Regulation Among Children With and Without ADHD: A Multimodal Approach

Alexis Garcia, Medical University of South Carolina

Hypothesis/Objective: This study utilized a multimodal approach to explore profiles of emotion regulation (ER) in mothers of young children with and without attention-deficit/hyperactivity disorder (ADHD). We also sought to understand how parent factors (i.e., skills, stress, ADHD symptoms) as well as child factors were associated with membership to these profiles.

Methods: The final sample consisted of 182 parent-child dyads. Sixty-six children were in the typically developing group (Mean age = 5.47, SD = .90, 74.2% males), and there were 116 children in the ADHD group (Mean child age = 5.41, SD = .75, 80.2% males). Dyads completed a stress-inducing task (clean up) during which mothers' heart rate variability (HRV), specifically, respiratory sinus arrhythmia and pre-ejection period, was collected. Maternal ER strategies and

parenting behaviors (proportion of DO and DON'T skills) were coded during the same clean up task. Mothers also completed self-reports of their ER strategies, parenting stress, parenting behaviors, and ADHD symptoms. Mothers and teachers completed questionnaires on child ER and ADHD symptoms. Children completed two frustration tasks to assess domains of emotion dysregulation.

Results: Latent profile analysis included maternal ER as indicators (HRV, self report, coding) and yielded 4 distinct profiles: mixed (n = 64), moderate (n = 49), low (n = 12), and high (n = 57) ER. Mothers in the low ER profile demonstrated the highest levels of observed ER difficulties. The moderate ER profile demonstrated some co-activation of the autonomic nervous system (ANS), yet were more behaviorally regulated than mothers in the low ER group. There were no differences between mixed and high ER profile on behavioral measures of ER but there was evidence of co-activation of the ANS for the mixed ER profile. Lastly, proportion of DON'T skills were associated with the probability of membership to each profile. Parenting stress and child hyperactivity/impulsivity symptoms was predictive of membership to high ER profile. There was a significant difference between diagnostic groups and membership to profiles, Pearson $\chi 2(3) = 8.39$, $p < .05$, such that there were more children with ADHD in the low ER profile.

Conclusions: Four distinct profiles of maternal ER emerged, highlighting the heterogeneity in maternal ER. Negative parenting behaviors, parenting stress, and child symptomology may also play a significant role in the development and maintenance of these maternal ER strategies. Future clinical trials should examine maternal ER as a potential therapeutic target.

SATURDAY, JANUARY 18, 2025

TRIS PHARMA POSTER HALL WITH BOXED LUNCHES
12:30 P.M. - 2:00 P.M.

*Denotes Presenting Author

1 - THE IMPORTANCE OF MOTOR COMPETENCE AND ADHD SYMPTOMS TO VISUAL-SPATIAL WORKING MEMORY IN YOUNG CHILDREN

*Hannah Scott[1], Erin Shoulberg[1], Marissa Dennis[2], Bethany Hunt[1], Mathilde Scarlata[1], Al Smith[3], Betsy Hoza[1]

University of Vermont[11], Boston Children's Hospital[2], Utah State University[3]

Hypothesis/Objective: Attention-deficit hyperactivity disorder (ADHD) is related to lower visual-spatial working memory (VSWM) abilities (Kasper et al., 2012) and impaired motor competence (MC; Farran et al., 2020). Limited research explores the relation among all three constructs. Understanding the unique and interactive relations between ADHD symptoms (inattention: IA and hyperactivity/impulsivity: HI), MC (fine and gross), and VSWM is important for intervention efforts. We examined these relations in an early elementary-aged sample.

Methods: Participants included 198 children (Mage = 6.84, SD = .97; 45.4% at risk for ADHD). Fine and gross MC were assessed via the Bruininks-Oseretsky Test of Motor Proficiency 2nd Edition Short Form (Bruininks & Bruininks, 2005). VSWM was assessed via the Wide Range Assessment of Language and Learning (Sheslow & Adams, 2003) finger windows task. Teachers rated children's IA and HI symptoms via the ADHD Rating Scale-IV (DuPaul, 1998). Across four hierarchical regression models, unique effects of HI or IA symptoms, fine or gross MC, and the interaction between ADHD symptoms and MC on VSWM were estimated.

Results: In all models, higher levels of MC were uniquely related to higher VSWM scores. All models demonstrated that higher levels of ADHD symptoms were uniquely related to lower VSWM scores. For one model there was a significant interaction effect in that the negative relation between HI and VSWM was only significant at high, but not low, levels of fine MC.

Conclusions: Given the unique associations of MC on VSWM abilities, MC should be considered when assessing VSWM, especially among children exhibiting ADHD symptoms.

2 - IS ADHD SYMPTOM VARIANCE BETTER EXPLAINED BY SPECIFIC NEUROPSYCHOLOGICAL DEFICITS OR GENERAL PERFORMANCE VARIABILITY?

*Virginia Peisch[1], Anika Banerjee[1], Anne Arnett[1]

Boston Children's Hospital[1]

Hypothesis/Objective: Clinical evaluation of attention deficit hyperactivity disorder (ADHD) often involves neuropsychological testing, which is difficult to access, expensive, and time consuming. Prior research indicates that there is no single neuropsychological profile for ADHD and overall performance variability may be a better clinical indicator. We tested whether 1) specific neuropsychological deficits or 2) variability in scores better explained variance in pediatric ADHD symptoms.

Methods: The study included 92 7-11-year-old children with and without an ADHD diagnosis (n=72 ADHD; Mage=9.47 years; 30% female). Children completed a comprehensive battery of neuropsychological tests (WISC-5 digit span, WISC-5 coding, Beery VMI-6, D-KEFS color-word interference test); scores were standardized and the standard deviation for each participant was used as a measure of individual variability. Caregivers reported on ADHD symptoms via the BASC-3. Linear regressions tested whether a specific neuropsychological skill or intra-individual variability in neuropsychological test performance were associated with ADHD symptoms.

Results: Inattention and hyperactivity symptoms were significantly explained by neuropsychological measures (i.e., F[4, 69]=3.59, adjusted R2=.12, p=.010 and F[4, 69]=2.96, adjusted R2=.10, p=.026, respectively). In linear regressions, verbal working memory accounted for significant variance in inattention symptom severity (b=-0.24, SE=0.11, p=.0357) over and above immediate auditory attention, processing speed, and inhibitory control. None of the neuropsychological measures were uniquely associated with hyperactivity symptom severity. In contrast, performance variability did not explain significant variance in inattention or hyperactive symptoms (F[1, 89]=0.004, adjusted R2=-0.011, p=.949 for inattention and F[1, 89]=0.1221, adjusted R2=-0.009, p=.727 for hyperactivity).

Conclusions: Together, neuropsychological tests explain about 10% of ADHD symptom variance, but performance variability is not a strong predictor of symptom severity. Verbal working memory explains unique variance in inattention. Neuropsychological tests are weakly associated with behavioral ADHD symptoms and may therefore have limited clinical utility.

3 - VIRTUAL REALITY-BASED ASSESSMENT OF FUNCTIONAL IMPAIRMENT IN CHILDREN WITH ADHD

*Harim Jeong[1], Soonjo Hwang[1], JoonHui Lee[2], Tai-Myoung Chung[2], Minjoo Kang[1]

University of Nebraska Medical Center[1], HippoT&C Inc.[2]

Hypothesis/Objective: This study posits that Virtual Reality (VR) data can serve as a valuable tool in predicting impairment in children diagnosed with ADHD, providing an objective complement to traditional assessment methods, which often rely on subjective reports. As VR-based approaches gain traction for their ability to capture behavior directly, especially in conditions like ADHD where symptoms are predominantly external, the potential of VR to assess impairment—an essential aspect in evaluating ADHD—remains underexplored. The objective of this study is to investigate whether movement data collected in a VR environment can reliably predict impairment in children with ADHD, offering clinicians evidence-based insights that could enhance the accuracy and effectiveness of ADHD assessments.

Methods: The study recruited 28 children diagnosed with ADHD (30% female) with an average age of 9.14 years (SD = 2.52) from a university hospital in the Midwestern United States. Impairment was assessed using the WEISS Functional Impairment Rating Scale (WFIRS). Participants were asked to complete two VR tasks: (1) a school-like task in which they arranged numbers on a blackboard according to color and sequence, and (2) a general conversation with a virtual avatar in a room-like setting. Movement data were captured using a head-mounted display and handheld controllers at 0.5-second intervals, and the total movement distance was calculated for analysis. Specifically, movement data were defined as the total distance moved by the head and hands, calculated using the Euclidean distance between 3D coordinates recorded at each interval. Interaction data, including the time taken to complete tasks, the number of mistakes made, and the time spent looking away from the blackboard, were normalized using a min-max scale, where lower values indicated better performance. Correlation and regression analyses were performed to assess the predictive power of the VR data on impairment.

Results: Correlation analysis revealed that movement data significantly predicted overall impairment ($p=0.012$, $r=0.351$), while interaction data did not show a significant correlation ($p=0.264$). Movement data also showed significant correlations with the WFIRS domains of family, school, social, and risk (all $p<0.05$). In contrast, interaction data demonstrated significance only within the school domain ($p=0.134$, $r=0.347$). Multiple regression analysis further indicated that movement data was a significant predictor of overall impairment ($p=0.022$, $R^2=0.129$) and the family domain ($p=0.027$, $R^2=0.115$). For the school domain, both movement and interaction data were significant predictors ($p=0.037$, $p=0.049$, $R^2=0.2$), whereas only movement data was significant in predicting impairment within the risk domain ($p=0.009$, $R^2=0.144$). No significant associations were found for the social, self-concept, life skills, or work impairment domains.

Conclusions: The study partially supports the hypothesis that VR data can predict impairment in children diagnosed with ADHD. Movement data, rather than functional task performance,

demonstrated greater predictive power, particularly in school, family, and risk-related impairments. This suggests that VR-captured movement metrics may be more sensitive indicators of certain functional impairments in ADHD than traditional task performance measures. Although the R^2 values were low, the significant p-values indicate that the observed relationships are not due to chance, and with a larger and more diverse dataset, the predictive power could be further validated and potentially improved. This research provides important insights into how VR technology can complement traditional assessments, particularly in contexts where objective measurement of impairment is crucial for accurate diagnosis and treatment planning. As diagnostic technologies evolve, these findings could pave the way for the development of more targeted and effective interventions tailored to the specific needs of ADHD patients. This approach could ultimately lead to better clinical outcomes and an enhanced quality of life for those affected by ADHD.

4 - BRAINGAZE: A NEW DIGITAL TOOL TO SUPPORT THE DIAGNOSIS OF ADULT ADHD

*Emanuela Offidani[1], Jim Potenziano[1], Hans Super[2]

Tris Pharma[1], BrainGaze; Institut de Neurociències, University of Barcelona; Institut de Recerca Pediàtrica, Hospital Sant Joan de Déu,[2]

Hypothesis/Objective: Visuospatial attention deficits are a hallmark of ADHD. This study aimed to investigate the potential of Braingaze, an innovative technology, to measure visuospatial attention in adults with ADHD. Braingaze leverage eye tracking to evaluate changes in the angle of eye vergence during an attention task, which have been shown to reflect shifts in attentional focus. The hypothesis is that adults with ADHD would show greater variability in the angle of eye vergence, as captured by Braingaze, compared to a clinical control group.

Methods: 108 adults (18-65 years old) with ADHD were compared to age-matched clinical controls with conduct problems but without ADHD (n=38). On a computer, participants were asked to discriminate cartoon images of a tadpole from a fish while fixating on a central point surrounded by eight possible target locations, with or without informative cues on where the stimuli were presented (cue/no cue conditions). The eye tracking was calibrated for each participant before the cognitive task.

Results: No difference in performance emerged between groups except for reaction time. In both cue conditions, the modulation of angle of eye vergence was weaker in individuals with ADHD. A machine learning model based on vergence signal data and blinded to ADHD status, differentiated the two groups with 79% accuracy, a false positive rate of 25%, and a false negative rate of 20.55%.

Conclusions: Braingaze is an innovative technology that can support the diagnosis of ADHD in adults based on changes in a digital biomarker (eye vergence) during attention tasks.

5 - COMPARING REMOTE AND LABORATORY-ADMINISTERED COMPUTERIZED NEUROPSYCHOLOGICAL ASSESSMENT OF ADULT ADHD SYMPTOMATOLOGY

* Dayeon Cho[1], Beth Krone[2], Richard Gallagher[3], Terry Leon[4], Caleb Massimi[4], Lauren Maytin[4], Lenard Adler[2]

NYU Langone School of Medicine[1], Icahn School of Medicine at Mount Sinai[2], New York University School of Medicine[3], NYU Langone Health- NYU Grossman School of Medicine [4]

Hypothesis/Objective: To examine similarities and differences of two computerized neuropsychological batteries in adult ADHD patients, administered under different testing conditions (WebNeuro (self-administered/remote) versus CANTAB (supervised/laboratory-based)).

Methods: Baseline neuropsychological ratings were obtained from two stimulant treatment studies at NYU Grossman SoM, in which one group used WebNeuro (N= 16) and another group used CANTAB (N= 86) (Adler et al., 2024; Krone et al., 2023). All participants were diagnosed with ADHD per DSM-V criteria. Subjects across two studies had similar demographic distribution in age, gender, race, and ethnicity. Additional data from Icahn Mount Sinai SoM will be included at the time of presentation.

Normed scores were calculated from the respective control group, and Chi-square testing was used to compare impairment status between the assessments.

Results: Several batteries showed consistency: attention and concentration reaction time had impairment rates of 45% in WebNeuro and 28% in CANTAB (NS). In contrast, response speed and information processing efficiency were inconsistent, with 14% impaired in WebNeuro vs. 83% in CANTAB ($p = 0.03$) and 0% impaired in WebNeuro vs. 39% impaired in CANTAB ($p = 0.04$).

Conclusions: Both assessments share certain similarities in reaction time, but also yield distinctive differences in response speed and information processing, suggesting that different testing conditions can influence the performance. Limitations of these analyses include: 1) that participants were not tested on both assessments; however, this is not possible due to learning effects and 2) the small n in the remote sample. Future research will require novel design approaches and larger samples.

6 - SCREENING FOR AUTISM SPECTRUM DISORDER AMONG COLLEGE STUDENTS HIGH RISK FOR ADHD

*Anna Workman[1], Zeina Kamareddine[2], Kaitlin Kearney[2], Michael Tate[3], Anthony Rostain[4], Mary Solanto[5], Sarah O'Neill[1]

[1], The City College of New York[2], Yeshiva University[3], Cooper Medical School of Rowan University[4], Hofstra-Northwell School of Medicine[5]

Hypothesis/Objective: ADHD, ASD and Social Anxiety Disorder (SAD) are commonly comorbid. Symptom overlap and impairment in social functioning, common to all three disorders, complicates assessment. This pilot study investigated profiles from the Autism-Spectrum Quotient (AQ), a validated screener for ASD, among college students assessed for ADHD. It was hypothesized that (i) total severity would differ across groups (high risk for ASD vs. ADHD+SAD vs. ADHD alone), and (ii) specific subscales, particularly Imagination, would differentiate individuals with ADHD or ADHD+SAD from those with ASD.

Methods: College students [N=68, Mean (SD) age=21.53 (3.03), 69% female, 68% BIPOC, 32% Latine] were recruited into a CBT intervention for executive dysfunction. Individuals at High Risk for ADHD (ASRS score ≥9) (Mean=13.35, SD=2.82) were evaluated using the AQ, interviews for ADHD (ACDS and AISRS), and the MINI (including the Autism module) to assess comorbid psychopathology.

Results: The AQ Mean score was 25.38 (SD=7.15). N=11 (16%) achieved a score ≥32, indicating High Risk for ASD; for n=3 (27%), ASD could not be ruled out. AQ total scores differed significantly across groups, $F(2, 53)=9.42$, $p<.001$, $\eta p2=.26$ [ASD Mean (SD)=38.00 (2.65) > ADHD+SAD Mean (SD)=26.96 (5.84) > ADHD Mean (SD)=22.76 (SD=6.75)]. A significant MANOVA, $F(10,100)=2.70$, $p=.006$, Pillai's Trace=.43, $\eta p2=.21$, revealed the ASD group had poorest functioning in Social Skills ($p>.001$, $\eta p2=.37$; ASD>ADHD+SAD>ADHD) and Communication ($p=.01$, $\eta p2=.16$; ASD>ADHD).

Conclusions: The Imagination subscale did not differentiate individuals with ASD from ADHD or ADHD+SAD. Differences in symptom severity common to all three disorders were obtained. Replication in larger samples is recommended.

7 - SCREENING FOR ADHD AMONGST RELATED DISORDERS

*Richard Powell[1], Joel Young[1], Anna Powell[1], Lisa Welling[2], Jaime Saal[1], Margot Nash[3], Jillian Fortain[1]

The Rochester Center for Behavioral Medicine[1], Oakland University [2], MedaData/MindMetrix[3]

Hypothesis/Objective: Analyses of methods of screening for ADHD typically involve comparisons between ADHD-focused screeners. The aim of this study was to understand how a positive result for ADHD may impact the relative likelihoods of achieving a positive screen result for other disorders, possibly identifying disorders with high likelihoods of co-occurring with ADHD, that should be also assessed at intake should ADHD be suspected.

Methods: 635 adult patients (62% female, 38% male; mean age = 35.15 (SD = 13.21); 91.1% White; 4.1% Black/African American; 2.4% Asian) underwent comprehensive psychiatric diagnostic screening at a large outpatient clinic. The comprehensive assessment included an automated delivery of disorder-specific sets of screeners (2 to 3 screeners per disorder analyzed) based on patient answers to a computerized symptom checklist. Dichotomous results (positive or negative) based on a majority or all screeners for the following disorders: PTSD, MDD, GAD, OCD, Eating Disorders (any); Bipolar 1 & 2, Alcohol Use Disorder, and Chronic Fatigue Syndrome being scored at or above the published clinical cut scores were analyzed via binomial logistic regression with the dichotomous screen results for ADHD entered as the predictor for each disorder.

Results: A positive screen for ADHD indicated significant ($p = 0.050$) likelihood increases of a positive screen for seven out of nine tested disorders (alcohol use disorder and bipolar 2 failed to achieve significance). The highest significant increases in odds likelihood were found for OCD (190.4% increase, $W(1)= 14.66$, $p < 0.001$), bipolar 1 (183.8% increase, $W(1)= 3.84$, $p = 0.050$), and chronic fatigue syndrome (111.2% increase, $W(1) = 21.41$, $p < 0.001$).

Conclusions: These results highlight the importance of wide-ranging screening at intake when ADHD is suspected. The possible presence of ADHD may increase the likelihood of a diverse range of other disorders, and understanding typical adult comorbidities should improve treatment planning and outcomes. These results are limited in generalizability due to limited geographic reach of the sample, and non-representativeness of the racial makeup of the sample.

8 - DRIVERS OF SATISFACTION WITH TREATMENT: PATIENT SURVEY RESULTS

*Richard Powell[1], Joel Young[1], Anna Powell[1], Margot Nash[2], Lisa Welling[3], Jillian Fortain[1]

The Rochester Center for Behavioral Medicine[1], MedaData/MindMetrix[2], Oakland University [3]

Hypothesis/Objective: Patient satisfaction with treatment is a critical dimension of therapeutic outcomes. The aim of this study was to analyze stored results of an outpatient clinic's periodically administered patient survey to identify predictors of satisfaction with psychiatric pharmacological treatment.

Methods: Aggregated results (n=1392, mean age = 42.5 (14.38 SD), 62% female, 38% male; 91.0% White, 4.1% Black/African American, 2.4% Asian) from a psychiatric outpatient clinic's semi-annually administered patient-facing survey were analyzed. Likert-type questions from the survey were grouped into four categories: Accessibility (cost and availability of the med), Effectiveness (subjective symptom improvement and duration of effect), Adverse Events (subjective severity level), and Satisfaction (initial expectations, overall satisfaction, and in comparison to past treatments). The data was analyzed via a structural equation model (SEM), with predictive pathways hypothesized between predictors; Accessibility, Effectiveness and Adverse Events; and, the outcome latent variable, Satisfaction.

Results: The SEM analysis found an acceptable-fitting model (RMSEA = 0.080; CFI = 0.960; PNFI = 0.664). The model found a strong predictive relationship between Effectiveness and Satisfaction (standardized regression weight = 0.96, $p < 0.001$), and a weak but significant relationship between Adverse Events and Satisfaction (standardized regression weight = -0.10, $p < 0.001$). Accessibility failed to demonstrate a significant predictive relationship with Satisfaction.

Conclusions: These results indicate that patient subjective ratings of effectiveness were strongly predictive of a patient's overall satisfaction with their pharmacological treatment, and may be among the most critical factors to consider when seeking improvements in outcomes closely related to patient satisfaction (e.g., adherence over time, compliance with treatment planning, an treatment stability). Future research should explore factors involved with reliably improving or weakening subjective effectiveness ratings. These results are limited in generalizability due to geographic homogeneity and lack of representation of minority races in the sample.

9 - GENETIC RISK FOR ADHD POTENTIATES THE DETRIMENTAL EFFECTS OF AMYLOID IN INDIVIDUALS WITH MILD COGNITIVE DECLINE

*Douglas Leffa[1], Brooke Molina[2], Luis Rohde[3], Tharick Pascoal[2], Bruna Bellaver[2], Guilherme Negrini[2], Guilherme Povala[2], Pâmela Lukasewicz Ferreira[2]

University of Pittsburgh Medical Center[1], University of Pittsburgh[2], Federal University of Rio Grande do Sul[3]

Hypothesis/Objective: Prior evidence suggests that the genetic risk for ADHD increases susceptibility to the harmful effects of amyloid-β (Aβ) pathology and is associated with increased risk for Alzheimer's disease (AD). However, the combined effects of ADHD and Aβ in individuals with mild cognitive impairment (MCI) is unknown. In this study, we tested the hypothesis that the genetic risk for ADHD interacts with Aβ leading to worse cognitive function and elevated markers of AD pathology in MCI.

Methods: We computed weighted ADHD polygenic risk scores (ADHD-PRS) in 501 individuals with MCI (mean age 72.3 [SD 7.3] years) with genomic information, clinical assessments, and CSF analysis for Aβ and phosphorylated tau. A subset underwent fluorodeoxyglucose positron emission tomography ([18F]FDG PET). Using regression models, we examined the interaction between ADHD-PRS and Aβ on cognition and AD biomarkers.

Results: We observed significant interactions between ADHD-PRS and Aβ, indicating that ADHD-PRS was associated with worse cognitive function and higher levels of CSF tau pathology only in Aβ-positive individuals. Additionally, increased ADHD-PRS was associated with hypometabolism across widespread cortical and subcortical regions among Aβ-positive participants.

Conclusions: In MCI, ADHD potentiated the detrimental effects of Aβ pathology leading to worse cognitive function, higher tau pathology, and brain hypometabolism. Our results suggest that genetic liability for ADHD increases susceptibility to the harmful effects of Aβ pathology in individuals with MCI.

10 - UNIQUE AND INTERACTIVE EFFECTS OF ADHD SYMPTOMS AND GENDER ON EARLY CHILDHOOD AGGRESSION

*Bethany Hunt[1], Erin Shoulberg[1], Hannah Scott[1], Mathilde Scarlata[1], Betsy Hoza[1]

University of Vermont[1]

Hypothesis/Objective: The positive link between attention-deficit/hyperactivity disorder (ADHD) and aggression is well-established, even in early childhood (Kakouros et al., 2005). Additional research is needed to determine if associations between preschoolers' distinct forms of aggression and ADHD symptoms vary based on gender. We explored the unique and interactive effects of gender and dimensional ADHD symptoms (inattention and hyperactivity/impulsivity) on overt aggression (OA) and relational aggression (RA) in a preschool-aged community sample.

Methods: Teachers reported on the behavior and gender of 58 children (Mage = 3.98 years, SD = 0.09; 48.3% female). Inattention and hyperactivity/impulsivity were assessed via the ADHD-IV Rating Scale: Preschool Version (McGoey et al., 2007). Forms of aggression were evaluated via the Preschool Social Behavior Scale–Teacher Form (Crick et al., 2011). Effects of inattention and hyperactivity/impulsivity, respectively, on each aggression form were probed using four hierarchical regression models.

Results: Inattention and hyperactivity/impulsivity uniquely predicted OA, but neither gender nor the interaction were associated with OA. Elevated ADHD symptoms were linked with greater risk for OA. Gender moderated the relation between ADHD symptoms and RA. Elevated levels of inattention ($b = .665$; $t = 3.299$; $p = .002$) and hyperactivity/impulsivity ($b = .602$; $t = 3.106$; $p = .003$) placed girls, but not boys, at greater risk of engaging in RA.

Conclusions: Gender-based differences in links between aggressive behavior and ADHD symptoms emerge early in development. Early interventions may mitigate potential adverse effects related to the perpetration of RA, especially among preschool girls with ADHD symptoms.

11 - THE ASSOCIATION BETWEEN GRIT AND EMOTIONAL REGULATION AMONG ADULTS WITH ADHD

*Elijah Bautista[1], Catrina Calub[2], Julie Schweitzer[3]

University of California, Los Angeles[1], MIND Institute, University of California, Davis School of Medicine[2], University of California, Davis[3]

Hypothesis/Objective: Existing literature suggests that individuals with ADHD tend to have lower levels of grit, defined as perseverance and sustained passion toward achieving a goal. Furthermore, emotional dysregulation–the inability to manage or flexibly respond to emotional states– is a key feature of ADHD. It may be possible that individuals who exhibit stronger grit are more effective regulators of emotion, however, current research has shown conflicting results. The current study seeks to investigate the association between grit and emotional regulation (ER) in adults diagnosed with ADHD and explore whether the relationship varies by gender. We hypothesize that those with higher self-reported grit will exhibit higher scores in ER.

Methods: Adult participants diagnosed with ADHD (N=70) aged 18-50 (30.5±7.2 years) participated in structured clinical interviews and assessments. Assessments included the Grit scale and subscales of the Styles of Emotion Regulation Questionnaire: cognitive reappraisal (CR) and emotion suppression (ES). Self-report data were analyzed using Pearson correlations.

Results: Consistent with our hypothesis, we found that grit was correlated with ER. Grit was positively correlated with CR ($r = .273$, $p = .018$) and negatively correlated with ES ($r = -.232$, $p = .046$). When examining this relation by gender, the correlation between grit and ES was only found in females ($r = -.381$, $p = .017$). In other words, female adults with ADHD who had higher grit had lower ES.

Conclusions: These results suggest that effective emotional regulation can enhance perseverance through challenges and setbacks, underscoring the potential benefits of emotional regulation interventions for individuals with ADHD.

12 - PRESCRIPTION ADHD MEDICATION USAGE IS ASSOCIATED WITH SELF-REPORTED LEVELS OF DAYTIME SLEEPINESS: DATA FROM THE NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY (NHANES)

*Michael Meinzer[1], Michael Meinzer[1]

University of Illinois at Chicago[1]

Hypothesis/Objective: ADHD is associated with a wide range of negative physical and mental health outcomes, including problematic sleep. One possible reason for difficulty with sleep may be prescription medication usage for ADHD (e.g., taking medication too late in the day and disrupting sleep patterns). The aim of the current study was to examine how prescription stimulant use is related to sleep difficulties in a nationally representative sample.

Methods: Participants were 15,560 individuals (Mage= 38.6 years, SD= .54; 51.1% female, 33.9% White, 26.3% Black, 22.7% Latino/a/x) from NHANES 2017-2020 who had available data on prescription drug use. Individuals were asked to endorse whether were prescribed stimulant or non-stimulant (i.e., Atomoxetine, Clonidine, Guanfacine) ADHD medications in the last 30-days (verified by assessor) and to report on their daytime sleepiness (i.e., extent in the past month that they felt excessively or overly tired during the day rated on a 5-point Likert scale).

Results: 2.1% of the sample reported being prescribed stimulant and non-stimulant ADHD medication. Controlling for prescription sleep medication usage, an independent samples t-test revealed that ADHD stimulant usage was significantly associated with greater levels of daytime sleepiness ($t(25)= 3.78$, $p<.01$). Additional analyses regarding number of minutes slept per night will be included in the poster presentation but data was not ready at the time of this abstract submission.

Conclusions: Results of this study provide preliminary support that ADHD prescription medication usage may contribute to self-reported levels of daytime sleepiness. Clinicians may need to enhance psychoeducation for adults prescribed medications for ADHD to improve sleep quality.

13 - INATTENTION IN TODDLERHOOD AS AN EARLY MARKER OF RISK FOR CHILDHOOD ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

*Leslie Rajendran[1], Brooke Molina[2], Heather Joseph[2], Erik Thiessen[3]

Drexel University College of Medicine[1], University of Pittsburgh[2], Carnegie Mellon University[3]

Hypothesis/Objective: Attention-deficit/hyperactivity disorder is the most common neurobehavioral disorder and has lifelong impairment. However, children with ADHD are often not identified until after significant impairments have occurred in academics, social functioning, and/or self-esteem. Individuals with ADHD have increased reaction time variability (RTV) across multiple tasks, but this finding has not been well studied in young children and toddlers. This project aims to examine early markers of inattention, reaction time (RT) and reaction time variability (RTV), among toddlers at high and low familial risk for ADHD.

Methods: Data were analyzed from the Pittsburgh ADHD Risk in Infancy Study, a longitudinal project following high and low-risk children born to parents with or without ADHD respectively, in search of early markers of later diagnosis. At least one parent met DSM-5 criteria for ADHD (high risk) or neither parent met criteria for ADHD (low risk) on semi-structured interview using the CAADID. RT/RTV were examined in 58 high and low-risk toddlers (M age= 20 months) via performance on the Visual Expectation Paradigm (VExP). The VExP is an action perception task that presents alternating visual stimuli for 3 minutes as a measure of learning and expectancy formation. Toddlers reacted to a simple left-right pattern and then a more complex right-right-left pattern; and gaze was coded.

Results: High-risk toddlers were found to have significantly longer RT (M=.74 s, SD=.33 s) than low-risk toddlers (M=.56 s, SD=.2 s), $t(31)=-1.908$, $p<.05$. High-risk toddlers had significantly higher RTV (M=.3 s, SD=.06 s) than low-risk toddlers (M=.26 s, SD=.08s), $t(30)=-1.73$, $p<.05$. High-risk toddlers also had fewer anticipatory eye movements (M=1.4, SD=1.4) than low-risk toddlers (M=3.1, SD=2.1), $t(29)=2.45$, $p<.05$.

Conclusions: Children at familial risk for ADHD have early markers of inattention (greater RT and RTV) as early as toddlerhood compared to toddlers born to parents without ADHD. This is the first study to identify an objective measure of inattention that could be used to discern children at high risk for developing childhood ADHD. These children may benefit from early intervention aimed at improving attention to reduce the prevalence of ADHD and associated impairments.

14 - BASELINE ASSOCIATION OF SUICIDALITY WITH PRO- AND ANTI-INFLAMMATORY IMMUNE FACTORS IN ADOLESCENTS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER (ADHD): A SECONDARY DATA ANALYSIS

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Hypothesis/Objective: To examine the relationship between immune factors and self-reported suicidal ideation in children with ADHD, we conducted a secondary data analysis.

Methods: Samples were collected as part of a multi-site randomized controlled trial, Micronutrients for ADHD in Youth (MADDY) study. Participants were children ages 6-12 years old who met DSM-5 criteria for ADHD as assessed by the Child and Adolescent Symptom Inventory, version 5 (CASI-5) parent-report questionnaire and had symptoms of irritability or anger. The Columbia-Suicide Severity Rating Scale (C-SSRS) Screening version was used to determine suicidal ideation at the baseline study visit. Additionally, twenty-five immune factors that include leptin, human growth factor (HGF), vascular endothelial growth factor-A (VEGF-A), and interleukins that have shown a putative role in psychiatric pathology and treatment response were collected at the baseline study visit. We will assess the associations between concentration of immune factors and suicidal ideation using point biserial correlations.

Results: Results will provide information about the association between suicidal ideation and immune factors in adolescents with ADHD.

Conclusions: Findings may direct future clinical decision-making regarding diagnosis and treatment efficacy. Findings will also direct future research in inflammatory biomarkers in ADHD.

15 - SKILLS ACQUISITION VS. PERFORMANCE DEFICITS: WHY DO CHILDREN WITH ADHD EXHIBIT SOCIAL PROBLEMS?

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Hypothesis/Objective: There is a growing understanding that the social problems exhibited by children with ADHD reflect inconsistent performance of learned skills rather than a knowledge gap (Aduen et al., 2018; de Boo & Prins, 2007), but prior work has been primarily theoretical and/or based on relatively small samples. The current study provides the largest investigation to date and builds on prior work by examining the extent to which ADHD-related knowledge acquisition vs. skill performance deficits differ across specific social skill domains.

Methods: Social Skills Improvement System (SSIS; Gresham et al., 2010) was administered to parents and teachers for a sample of 277 clinically-evaluated and carefully-phenotyped children aged 8 to 13 years (M = 10.3, SD = 1.40, 78 girls) from the Southeastern U.S. Participants included 191 children with ADHD and 86 children without ADHD (non-ADHD group). The SSIS measures 7 specific social skill domains (Communication, Cooperation, Assertion, Responsibility, Empathy, Engagement, and Self-Control). acquisition deficits and performance deficits were identified for each social skill domain, separately for parents and teachers, using the Gresham et al. (2010) social behavioral analysis of each informant's item-level endorsements. Negative-binomial generalized linear models were conducted given evidence of zero-inflation, separately for acquisition and performance deficits, with informant (parent, teacher) and social skill domain (listed above) as within-subjects factors, group (ADHD, non-ADHD) as the between-subjects factor, and covariates (age, SES, sex), using Jamovi v. 2.3 (The jamovi project, 2023) and R package 'performance' (Lüdecke et al., 2021).

Results: When compared to the non-ADHD group, children with ADHD were more likely to be perceived by parents and teachers as missing important social knowledge (acquisition deficits) in the domains of communication ($p = .002$), cooperation ($p < .001$), responsibility ($p < .001$), and self-control ($p < .001$). Despite these differences, acquisition deficits in ADHD were relatively rare: There were no specific (item level) social skills that parents and teachers agreed were missing in at least 15% of children with ADHD, although teachers endorsed that a subset (25-32%) of children in the ADHD group were missing skills related to not bothering others and asking help from adults.

In contrast, performance deficits among children with ADHD were more prevalent. The omnibus model indicated that children with ADHD exhibit higher rates of inconsistent performance in terms of communication ($p < .001$), cooperation ($p < .001$), empathy ($p < .001$), responsibility ($p < .001$), and self-control ($p < .001$). There was broad agreement between parents and teachers that the majority (>50%) of children with ADHD have difficulty consistently implementing the skills they know with regard to attending to instructions and following directions. Parents but not teachers also reported that 50%+ of the ADHD group exhibit performance deficits in staying calm when teased/criticized/disagreeing, compromising with others, taking responsibility, and

not bothering others. Teachers but not parents reported performance deficits at this frequency only for following classroom rules.

Conclusions: The results provide the strongest evidence to date suggesting that social problems in children with ADHD primarily reflect consistently inconsistent performance of known social skills, rather than these children not knowing how to skillfully engage socially. While acquisition deficits occurred at higher rates for children with ADHD than their peers, they were rare and idiosyncratic, suggesting that ADHD does not confer significant risk for failure to learn any specific social skill.

Performance deficits, on the other hand, were more pronounced and were observed across home and school settings by different informants. There was broad agreement by parents and teachers that children with ADHD know these skills, but have difficulty implementing them consistently. These findings may explain the inefficacy of traditional social skills training for ADHD that focused on teaching and practicing skills in clinic settings (de Boo & Prins, 2007; Mikami et al., 2013). Instead, the findings support development and testing of newer programs that emphasize spontaneous, in-vivo intervention rather than simple social skills memorization (Mikami et al., 2022).

16 - EXAMINING OBJECTIVELY-MEASURED MOTOR ACTIVITY AMONG CHILDREN WITH AND WITHOUT ADHD AND GAD

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Hypothesis/Objective: Meta-analytic evidence suggests that children with ADHD, regardless of subtype, exhibit increased motor activity, especially during tasks that overwhelm underdeveloped neurocognitive abilities. Increased motor activity in the form of hyperactivity and restlessness may, however, feature among other disorders, like GAD. Previous studies examined this phenomenon and found that elevated activity levels were present among adults with ADHD, whereas adults with GAD exhibited similar levels to healthy controls during cognitively demanding tasks. Conclusions and implications from such studies remain limited, however, as they exclusively focused on adults.

Methods: The current study examined actigraph-measured motor activity in 220 clinically evaluated children ages 8-13 with and without ADHD and/or GAD across two working memory conditions (phonological and visuospatial) and two control conditions.

Results: A mixed-model ANOVA yielded a significant group x task interaction ($p < .001$) that was attributable to disproportionate increases in activity among ADHD and ADHD+GAD groups relative to GAD and healthy control groups as working memory demands increased. Evidence supporting a main effect of task ($p < .001$) indicated that all participants exhibited higher activity during working memory tasks relative to control conditions. Post hoc analyses revealed that activity in the GAD group did not significantly differ from healthy controls during any of the task conditions.

Conclusions: When working memory demands were elevated, increased motor activity was demonstrated only among children with ADHD and ADHD+GAD, whereas children with GAD demonstrated similar activity levels to neurotypical children. As such, increased motor activity may be a unique feature of ADHD.

17 - CO-OCCURRING ADHD AND ANXIETY IN YOUTH: LINKS WITH SOCIAL FUNCTIONING IN AN ICELANDIC SAMPLE

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Hypothesis/Objective: Youth with ADHD commonly experience social functioning deficits. ADHD and anxiety often co-occur, which may lead to greater social impairment. Research on the co-occurrence of ADHD and anxiety and its impact on social impairment has largely been mixed and limited to research based in the United States. The current study examines ADHD, anxiety, and social impairment in an Icelandic sample.

Methods: The current sample consists of 1,849 children (aged 7-10 years) referred to a psychological clinic in Iceland. Social difficulty was assessed via multiple informants, using the Autism Spectrum Screening Questionnaire (ASSQ). Factor 1 of the ASSQ features items related to social deficits. Four groups were defined: ADHD (n = 865), Anxiety (n = 172), and ADHD + Anxiety (n = 168), and Control (n = 644).

Results: One-way ANOVAs were conducted to examine social difficulty differences across groups. The overall ANOVAs were significant (ps<.05). Father and teacher reports revealed no significant differences across groups of interest. Mothers reported significantly greater social difficulties for ADHD + Anxiety (M=7.58), ADHD (M=6.34), and Anxiety (M=5.62) relative to Control (M=4.57) groups. ADHD + Anxiety had significantly greater social difficulties than the Anxiety and ADHD groups (ps < .05).

Conclusions: Mothers reported greater social difficulties for ADHD + Anxiety relative to ADHD. Mothers may be better attuned to the social difficulties in their children relative to teachers and fathers, but additional research is needed to assess. Clinicians working with ADHD + anxiety youth should assess for and consider social difficulties as an intervention target.

18 - PRELIMINARY EVIDENCE THAT USE OF A FIDGET DEVICE BY ADULTS WITH ADHD CHANGES BUT DOES NOT REDUCE BIOBEHAVIORAL SIGNS OF ANXIETY.

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Hypothesis/Objective: Fidgeting devices are popular for managing ADHD, but their effectiveness remains unclear. This study investigated whether fidgeting modulates self-regulation in adults with ADHD during stress, exploring intrinsic and extrinsic fidgeting. We hypothesized that individuals with a fidget ball during a stressful task would demonstrate improved self-regulation, reflected by higher heart rate variability (HRV) and lower anxiety levels.

Methods: Adults with ADHD were randomly assigned to a fidget ball (n=49) or no fidget ball (n=24) group. Physiological stress was measured via HRV and intrinsic fidgeting was measured via actigraphy. Physiological data were collected at baseline and during the Trier Social Stress Test (TSST). Self-rated anxiety was measured using the State Anxiety Inventory.

Results: Heart rate and fidgeting increased across TSST stages for both groups, with no significant differences in heart rate, HRV, or intrinsic fidgeting between groups. Interestingly, however, the fidget ball group had weaker correlations between fidgeting and HRV compared to the no fidget ball group. At baseline, the no fidget ball group showed a positive correlation between intrinsic fidgeting and HRV, suggesting an association between intrinsic fidgeting and self-regulation. During stress, intrinsic fidgeting and HRV were significantly negatively correlated, likely because anxiety is associated with intrinsic fidgeting and HRV. The relationship between physiological measures and anxiety differed between groups and TSST stages.

Conclusions: These results provide preliminary evidence that the fidget ball may disrupt the expected association between intrinsic fidgeting and HRV. Given these results, further studies are needed to investigate how intrinsic fidgeting is associated with self-regulation.

19 - GROWTH TRAJECTORIES OF YOUTH WITH DELAYED-RELEASE/EXTENDED-RELEASE METHYLPHENIDATE, LISDEXAMFETAMINE DIMESYLATE, OR OSMOTIC RELEASE ORAL SYSTEM METHYLPHENIDATE VERSUS NON-ADHD CONTROLS: A RETROSPECTIVE US CLAIMS ANALYSIS

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Hypothesis/Objective: CNS stimulants are associated with height/weight suppression in youth with ADHD. JORNAY PM® is an evening-dosed delayed-release and extended-release methylphenidate (DR/ER-MPH) absorbed in the colon with no immediate-release component. Growth trajectories of patients prescribed DR/ER-MPH, osmotic release oral system (OROS) MPH (Concerta®), or lisdexamfetamine dimesylate (LDX; Vyvanse®) were compared to non-ADHD controls.

Methods: Patients aged 6–17y with prior stimulant use who were newly prescribed DR/ER-MPH, OROS MPH, or LDX between 2019–2022 with persistent treatment for ≥1y were retrospectively identified from medical/prescription claim databases (New Data Warehouse, IQVIA) and matched 1:2 with non-ADHD controls. Weight and height trajectories after 1y, using data from a linked electronic medical records database (Ambulatory EMR, IQVIA) were modeled with repeated measures mixed effects models (DR/ER-MPH, OROS MPH, or LDX vs controls).

Results: Modeled height and weight trajectories did not differ between drug and their matched control groups prior to index treatment (all $P>0.05$). For DR/ER-MPH (n=131) weight increased significantly versus controls (n=262) over 1y (+6.9kg vs +4.4kg; $P<0.0001$); height increases were similar (+5.8cm vs +5.5cm; $P=0.4253$). For LDX, weight and height (n=451) decreased significantly versus controls (n=902) (+2.7kg vs 4.7kg; $P<0.0001$ and +4.3cm vs +5.1cm; $P<0.0001$). Weight and height changes were similar between OROS MPH (n=349) and controls (n=698) (+4.9kg vs +4.6kg; $P=0.2056$ and +5.2cm vs +4.8cm; $P=0.1494$).

Conclusions: In youth with prior stimulant use, LDX showed significant suppression of weight versus non-ADHD controls while DR/ER-MPH showed significant increases in weight versus controls. Potential benefits of DR/ER-MPH in patients with suppressed height/weight trajectories merits further exploration.

20 - RESTING EEG BIOMARKERS FOR STIMULANT RESPONSE IN PEDIATRIC ADHD: A PILOT STUDY

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Hypothesis/Objective: Improved understanding of the neurobiological mechanisms driving individual differences in ADHD medication response is critical to the development of precision medicine guidelines for ADHD. Building on prior brain imaging studies, we conducted a pilot study to test our hypothesis that EEG (electroencephalography) features would reflect distinct effects of methylphenidate (MPH) and amphetamine (AMP) stimulant classes on cortical activity. Secondarily, we predicted that EEG markers would be associated with ADHD symptom improvement.

Methods: Sixteen medication-naïve, 7-11-year-old children with confirmed ADHD completed resting EEG at baseline and on optimal treatment with MPH (n=15) and/or AMP (n=11). Symptom improvement was measured with parent ratings on the NICHQ Vanderbilt Assessment Scale from baseline to medicated follow-up. Resting EEG outcomes of interest were frontal theta and central theta-beta ratio (TBR).

Results: Compared to baseline, participants exhibited greater average frontal theta power on MPH. A decrease in central TBR was associated with AMP treatment, and to a lesser extent, MPH treatment. Greater symptom improvement was associated with reduced frontal theta power on AMP and modestly associated with reduced central TBR on both medications. Finally, greater frontal theta at baseline predicted symptom improvement on both AMP and MPH.

Conclusions: MPH and AMP had distinct effects on resting EEG features, consistent with prior literature. Changes in cortical activity were uniquely associated with symptom improvement for each medication. Baseline frontal theta is a candidate biomarker for response to both stimulant classes. Results support the potential for EEG as a precision medicine tool for ADHD.

21 - INHIBITORY CONTROL AND PARASYMPATHETIC ACTIVITY IN CHILDREN WITH DISRUPTIVE BEHAVIOURS AND ADHD SYMPTOMS

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Hypothesis/Objective: The study aimed to explore the relationship between ADHD symptoms, inhibitory control (IC), and respiratory sinus arrhythmia (RSA) in children, with a focus on those exhibiting disruptive behavior (DB). It was hypothesized that higher ADHD symptoms would lead to slower IC response times and that RSA would add explanatory value beyond ADHD symptoms alone.

Methods: The study recruited 40 children aged 6-12 with varying levels of ADHD symptoms and DB. RSA was measured during baseline and task conditions, and IC was assessed using the Stop Signal Task. ADHD symptoms were measured using the CBCL ADHD Scale, while DB was determined through the Conduct Problems subscale of the CBCL. Statistical analyses included correlational and regression models to examine the relationships between RSA, ADHD, and IC.

Results: No significant relationships were found between RSA and either ADHD symptoms or IC performance. The results suggest that RSA may not serve as a consistent physiological marker for IC deficits in children with ADHD and DB, as previously hypothesized.

Conclusions: The study's non-significant findings challenge existing assumptions about RSA's role in ADHD and IC. Future research should investigate additional physiological and cognitive markers while considering the complexity of comorbid conditions like DB. Interventions targeting ADHD may benefit from addressing emotional regulation and executive functioning rather than solely focusing on inhibitory control.

22 - ADAPTIVE FUNCTIONING IN CHILDREN WITH ADHD: THE ROLE OF COMORBIDITIES AND SOCIAL DETERMINANTS OF HEALTH

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Hypothesis/Objective: Objective: This study aimed to (a) assess adaptive functioning in children with ADHD, with and without comorbidities including Autism Spectrum Disorder (ASD), Specific Learning Disorders (SLDs), language disorders, Intellectual Developmental Disability (IDD), anxiety/depression, and (b) examine how these profiles vary by aspects of social determinants of health, including quality of resources in children's neighborhood and caregiver education.

Methods: Methods: Pediatric outpatients (N=2,595; 69.4% male; age M=10.96 years, SD=3.58; 49.5% Medicaid; 48.6% White, 31.8% Black) undergoing neuro/psychological evaluations were included if they had a diagnosis of ADHD, a caregiver-completed measure of adaptive functioning and a geo-coded neighborhood opportunity score.

Results: Results: Adaptive functioning scores fell at least one standard deviation below the normative mean for youth with ADHD alone. Children with co-occurring ASD, language disorders, IDD, or multiple comorbidities had significantly lower adaptive skills than those without these conditions. Children with ADHD and SLDs or anxiety/depression—the largest subgroups—did not differ significantly from those with ADHD alone. Social determinants like higher neighborhood opportunity and higher caregiver education were associated with stronger adaptive skills in children with ADHD alone, ADHD with anxiety/depression, and ADHD with SLDs, but not in those with co-occurring language disorders, ASD, or IDD.

Conclusions: Conclusions: Many children with ADHD struggle with adaptive skill development, with social determinants playing a key role for most. However, children with co-occurring ASD, IDD, or language disorders faced greater adaptive challenges that were not explained by social factors, highlighting the need for targeted interventions.

23 - COUNTING SHEEP AND SYMPTOMS: UNDERSTANDING THE MINIMAL CLINICALLY IMPORTANT DIFFERENCE (MCID) IN TREATMENT OF SLEEP DIFFICULTIES AND ADHD

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Hypothesis/Objective: While ADHD and sleep difficulties commonly co-occur in children, and treatment options exist, little is known about which outcomes of treatment are most important to caregivers. Economic disadvantage increases risk for both sleep difficulties and treatment engagement. The goal of this study is to understand which outcomes of treatment are most important to caregivers and how much treatment-related improvement in these outcomes is viewed as meaningful.

Methods: Twenty caregivers of economically disadvantaged children (75% male; Mage=10.1, SD=3.52) with ADHD and parent-reported sleep difficulties completed an anonymous survey asking about the importance of improvement across both proximal (sleep-related) and distal (symptom/functioning-related) treatment outcomes.

Results: Most parents (>80%) considered improvement in ADHD symptoms, social, emotional, and academic functioning to be very to extremely important, with somewhat fewer (55%) rating physical health improvements as similarly important. Fifty to 60% of parents rated improvement in sleep onset latency, total sleep time, bedtime, and waketime as somewhat to very important. Over half of parents indicated that at least a 50% reduction in ADHD symptoms, physical health, or social, emotional, or academic functioning would indicate meaningful change. On average, a 30-40 minute improvement in sleep onset latency, total sleep time, and earlier bedtime, along with a 20-minute later waketime, was considered meaningful.

Conclusions: Caregivers tended to rate distal (symptom- and functioning-related) treatment outcomes as slightly more important than proximal (sleep-related) outcomes. Treatment effects on both distal and proximal outcomes would need to be large in order to be considered meaningful to caregivers.

24 - IMPACT OF INTRINSIC FACTORS ON THE EFFICACY OF CENTANAFADINE IN A PEDIATRIC POPULATION WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

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Hypothesis/Objective: To explore the impact of intrinsic factors on the efficacy of centanafadine (CTN), a norepinephrine, dopamine, serotonin reuptake inhibitor, in pediatric patients ADHD.

Methods: Two pivotal phase 3 trials randomized children (6-12y) or adolescents (13-17y) to once-daily extended-release CTN (low- or high-dose) or placebo for ADHD treatment over 6 weeks; dosing in children was weight-based. The primary efficacy endpoint was mean change from baseline to Week 6 in ADHD-RS-5 symptoms total raw score; key secondary endpoints included the mean change from baseline to Week 6 in Conners 3-Parent Short (PS) Hyperactivity/Impulsivity and Inattention content scale T-scores. Subgroups included sex at birth, race, and ethnicity. Analyses used a mixed-effect model for repeated measures. As exploratory analyses, P-values were not controlled for multiplicity and are descriptive.

Results: In children, 58% (280/480) were male, 65% (312/480) White, and 31% (149/480) Hispanic/Latino; in adolescents, 59% (272/459) were male, 70% (323/459) White, and 28% (129/459) Hispanic/Latino. In both studies, for the primary endpoint, female, White, Hispanic/Latino, and not Hispanic/Latino subgroups treated with high-dose CTN demonstrated a significant difference versus placebo ($P<0.05$). In both studies, male, White, and not Hispanic/Latino subgroups treated with high-dose CTN demonstrated a significant difference vs placebo ($P<0.05$) for the Hyperactivity/Impulsivity content scale. Similarly, male, female, White, and not Hispanic/Latino subgroups also demonstrated a significant difference vs placebo ($P<0.05$) for the Inattention content scale. Treatment-by-subgroup interactions were not significant.

Conclusions: Intrinsic factors of sex at birth, race, and ethnicity did not seem to impact CTN efficacy in pediatric patients with ADHD.

25 - IMPACT OF COMORBID SUBSTANCE USE DISORDER ON ADHD TREATMENT PATTERNS IN ADULTS

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Hypothesis/Objective: Comorbidity between ADHD and substance use disorder (SUD) is common, and CNS stimulants, the first-line treatment for ADHD, have the potential for misuse. This study aimed to examine how comorbid SUD affects treatment choices in adults with ADHD.

Methods: Using retrospective data from the TriNetX Research Network, we compared treatment choices for adults with ADHD, with and without comorbid SUD. Odds ratios (ORs) and relative risks (RRs) were calculated to assess associations between SUD and treatment choices for ADHD.

Results: We identified 1,525,828 eligible adults aged 18-65 with ADHD, of whom approximately 25% (373,710) had a comorbid SUD diagnosis. Adults with ADHD and SUD were less likely to be prescribed CNS stimulants (methylphenidate, amphetamine, lisdexamfetamine; OR range: 0.73–0.97) and more likely to receive non-stimulants (atomoxetine, viloxazine, bupropion; OR range: 1.27–2.20), compared to those without SUD. When stratified by specific substances (nicotine, alcohol, cannabis, or opioids) or by age (26-45 and 46-65), prescription patterns were comparable across substances (i.e., OR for nicotine was comparable to that for opioids) across the assessment period. The only subpopulation where amphetamine prescription rates were comparable between the SUD and non-SUD groups was adults aged 18–25. In this younger group, prescription rates for stimulants increased (RR range:1.06–1.23) following the first SUD billing code.

Conclusions: Comorbid SUD significantly influences ADHD treatment choices in adults. Those with comorbid SUD are less likely to receive CNS stimulants. This pattern remains consistent across substance types and age groups, except for the 18-25 age group, where stimulant use increases after SUD diagnosis.

26 - PHARMACOKINETICS AND BIOEQUIVALENCE OF A NOVEL EXTENDED-RELEASE FORMULATION OF METHYLPHENIDATE HYDROCHLORIDE FOR ATTENTION DEFICIT HYPERACTIVITY DISORDER

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Hypothesis/Objective: Extended-release (ER) methylphenidate formulations are commonly used to treat attention-deficit/hyperactivity disorder (ADHD) in both children and adults. Previous studies have shown that the clinical effectiveness of long-acting methylphenidate formulations is closely tied to their pharmacokinetic (PK) profile, highlighting the need for careful dose optimization and consistency in drug exposure. Osmodex-methylphenidate ER uses an osmotic pump design to provide controlled release of drug over the course of the day and is available in 7 dosage strengths, including unique 45 and 63 mg tablets. This study aimed to determine the bioequivalence of this Osmodex-methylphenidate ER to the osmotic release oral system (OROS)-methylphenidate ER reference product.

Methods: In this 4-period replicate crossover study, the PK profile of a single 72 mg tablet of Osmodex-methylphenidate ER (Relexxii®, Vertical Pharmaceuticals, LLC) was compared to two 36 mg tablets of OROS-methylphenidate ER (Concerta®, Janssen Pharmaceuticals, Inc.), the reference product, in healthy subjects (N=60).

Results: Both products demonstrated similar PK parameters, including during the critical window 7–12 h post-dose. Statistical bioequivalence between the two formulations was confirmed for maximum drug concentration (Cmax), area under the curve0-3 h (AUC0-3 h), AUC3-7 h, AUC7-12 h, and AUCinf. Safety and tolerability were similar for both products, with no serious adverse events reported.

Conclusions: Osmodex-methylphenidate ER demonstrated a PK profile that is bioequivalent to OROS-methylphenidate at critical time points through 12 hours; thus, similar efficacy is expected compared to OROS-methylphenidate throughout the day.

27 - FAMILY PREDICTORS OF ENGAGEMENT WITH VIRTUAL BEHAVIORAL PARENT TRAINING

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Hypothesis/Objective: Greater parental engagement with behavioral parent training (BPT) increases ADHD symptom improvement (Pfiffner et al., 2022). However, child ADHD symptom severity (ADHDSev) and emotion dysregulation (ED) negatively influence parental engagement (Hawkey et al., 2024). This study extends prior work examining child characteristics to include parent factors' influence on weekly skill use during a virtual, school-based BPT intervention. We hypothesized greater baseline child ED, ADHDSev , and parenting stress (PS), and lower positive parenting would predict less between-session BPT skill use.

Methods: Parents of identified 2nd to 5th grade students (N=56, M age = 8.51, SD = 1.53) completed an 8-week virtual BPT intervention delivered by school mental health providers. Parents completed baseline questionnaires and reported between-session skill use weekly. Multilevel models examined baseline family-level predictors of weekly between-session skill use: ED, ADHDSev, PS, and positive parenting (PP).

Results: Higher PP, PS, and ADHDSev led to significantly higher overall skill (i.e., intercept effects, ps < .05). ED amplified ADHDSev (p=.01) such that higher levels of both predicted greater overall skill use; however, ED but was not significant alone (p=.11). Higher baseline ADHDSev significantly decreased the slope of weekly skill use (p=.03).

Conclusions: Surprisingly, higher baseline parental PS and child ADHDSev led to greater skills use at the start of the intervention along with higher PP – perhaps due to greater motivation for treatment. However, higher ADHDSev led to declines in skill use over time. Assessing these factors at baseline may illuminate which families need more support engaging with weekly BPT skills.

28 - IMPACT OF CENTANAFADINE ON EXECUTIVE FUNCTIONING IN PEDIATRIC PATIENTS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER: ANALYSIS OF CONNERS 3 AND EXIT SURVEY RESPONSES

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Hypothesis/Objective: To compare the executive functioning (EF) efficacy measure with patient exit interviews in a pediatric population treated with centanafadine (CTN), a norepinephrine, dopamine, serotonin reuptake inhibitor for ADHD.

Methods: Two phase 3 trials (NCT05428033 & NCT05257265) evaluated the efficacy and safety of once-daily extended-release CTN for ADHD treatment (aged 6-12y and 13-17y, respectively). Patients were randomized (1:1:1) to high-dose CTN, low-dose CTN, or placebo (children received weight-based CTN) for 6 weeks. A key secondary efficacy endpoint was the change from baseline in Conners 3-Parent Short EF content scale (containing 5 individual line items) T-score at Week 6, analyzed via a mixed-effect model for repeated measures. For the exit survey, values reflect those who selected either “somewhat better” or “much better.” All data reported here were collected via caregiver proxy.

Results: Mean baseline EF T-scores were 74.3 in adolescents and 78.6 in children. In patients treated with high-dose CTN, a greater number of adolescents (48% vs 26%; P=0.0002) and children (40% vs 26%; P=0.0163) had a clinically meaningful change (≥13-point reduction) in EF T-scores versus placebo. Per the caregiver-reported exit survey, of those treated with high-dose CTN, 71% (vs 43% placebo) of adolescents and 52% (vs 38% placebo) of children saw improvement in completing tasks at home. Similarly, 65% (vs 49% placebo) of adolescents and 50% (vs 38% placebo) of children saw improvement in completing work at school.

Conclusions: Consistent with clinically meaningful change in EF, caregiver-reported perceptions of completing tasks at home and school showed improvement.

29 - 5-HT2C RECEPTORS CONTRIBUTE TO VILOXAZINE'S EFFECTS ON ADHD-RELEVANT BEHAVIORS IN RATS ON THE 5-CHOICE SERIAL REACTION TIME TASK

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Hypothesis/Objective: Viloxazine ER (extended-release capsules), a non-stimulant medication FDA-approved for Attention-Deficit Hyperactivity Disorder (ADHD), is a moderate potency norepinephrine transporter inhibitor that, unlike other norepinephrine reuptake inhibitors, has activity at serotonin (5-HT) receptors, including 5-HT2C (partial agonist), 5-HT2B (antagonist), and 5-HT7 (antagonist). Viloxazine's effects on attention and impulsivity were evaluated using the 5-choice serial reaction time task, with and without pretreatment of the selective 5-HT2c antagonist SB242084, in order to evaluate the potential contribution of its 5-HT2C activity to its therapeutic effects.

Methods: Adult, male Wistar rats (N=22) were trained and treated with nicotine (0.2mg/kg; positive control), viloxazine (1, 3, 10, 20, 30mg/kg), and SB242084 (0.025, 0.05, 0.1mg/kg) under variable intertrial interval conditions (vITI; 2.5, 5, 10s ITI). Viloxazine 10 and 20mg/kg were paired with SB242084 (0.05, 0.1mg/kg), to examine the effects of 5-HT2C blockade on viloxazine's behavioral profile. Repeated-measures ANOVA was conducted, followed by post-hoc tests for specific comparisons (Holm-Sidak), with significance set to $p<0.05$.

Results: Viloxazine (3mg/kg and higher) dose-dependently decreased impulsivity (premature responses, $p<0.001$). At 10mg/kg and higher viloxazine reduced attention measures (decreased %Hit, increased omissions) under high attentional load (2.5s ITI trials; $p<0.001$). SB242084 (0.05, 0.1mg/kg) exhibited no behavioral effects when administered alone, but when administered prior to viloxazine, SB242084 attenuated viloxazine effects on impulsivity and reversed its effects on attention.

Conclusions: Viloxazine-mediated effects on impulsivity and attention were sensitive to 5-HT2C antagonism. These data support the involvement of 5-HT2C in viloxazine's pharmacology and efficacy in ADHD-relevant behaviors.

30 - PHARMACOKINETICS OF VILOXAZINE EXTENDED-RELEASE CAPSULES IN BREASTMILK OF HEALTHY LACTATING WOMEN

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Hypothesis/Objective: Despite increasing ADHD treatment in women, ADHD medication safety in pregnancy and lactation is not well documented. Viloxazine ER is the first ADHD medication studied under the new FDA Guidance on Clinical Lactation Studies. We report pharmacokinetics of viloxazine and its major metabolite (5-HVLX-gluc) in breastmilk and estimate infant exposure.

Methods: Healthy lactating women (N=15; median weight 68.8kg) received viloxazine ER 600mg/day (maximum recommended adult dosage) for 3 days (NCT06259331). Calculated measures of potential infant exposure included: Daily Infant Dosage (DID): total daily drug present in breastmilk with potential to be consumed by infant; Estimated Daily Infant Dosage (EDID): milk-plasma ratio [ML/PL] x average steady-state maternal plasma concentration x estimated infant milk intake/kg/day; and Relative Infant Dose (RID): EDID/weight-adjusted maternal daily dosage x 100.

Results: Viloxazine did not appear to affect daily milk production. At steady-state, median Tmax in breastmilk was 5.5h. Mean DID of viloxazine and 5-HVLX-gluc were 0.599±0.322 and 0.0393±0.0175 mg/day (~0.1% and 0.007% of the 600mg/day viloxazine ER dose). Mean viloxazine EDID-150 (milk intake of 150 mL/kg/day) was 0.141±0.0519 mg/kg/day; mean viloxazine EDID-200 (using early infancy milk intake of 200 mL/kg/day) was 0.189±0.0692 mg/kg/day. Mean RID-150 and RID-200 of viloxazine were 1.58±0.424% and 2.11±0.565%, respectively. Mild treatment-related AEs were reported by 80% of participants, most commonly somnolence (67%), nausea (20%), and dizziness (20%). No participants discontinued.

Conclusions: The estimated daily viloxazine exposure in breast-fed-infants is ~2% of weight-adjusted maternal daily dose. Lactation specialists consider medications with RID <10% generally acceptable for breast-feeding.

31 - EFFICACY OF CENTANAFADINE FOR THE TREATMENT OF ADULTS WITH SEVERE COMBINED PRESENTATION OF ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

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Hypothesis/Objective: ADHD is a chronic and prevalent neurodevelopmental disorder in adults, characterized by symptoms of inattention, hyperactivity, and impulsivity. This post hoc analysis evaluated the efficacy of centanafadine (CTN)—a norepinephrine, dopamine, serotonin reuptake inhibitor—in a subgroup of adults with severe combined presentation of ADHD.

Methods: Data from 2 identically designed phase 3 trials were pooled. Eligible patients aged 18–55 years with a primary ADHD diagnosis per DSM-5 were randomized to receive CTN 200 or 400mg/day or placebo. Endpoints included changes from baseline in Adult ADHD Investigator Symptom Rating Scale (AISRS) total score and Clinical Global Impression-Severity (CGI-S) at Week 6. Severe combined presentation of ADHD subgroup was defined as baseline AISRS score of >36 and ≥5 Inattentive and Hyperactive/Impulsive symptoms. Endpoints were analyzed using a mixed-effects model for repeated measures without adjusting for multiplicity.

Results: Of the 859 adults randomized, 55.9% (n=480) had severe combined presentation of ADHD at baseline. At Week 6, both doses of CTN demonstrated improvement in core ADHD symptoms per AISRS total score with effect sizes (ES) of 0.30 for 200mg and 0.29 for 400mg vs placebo. Improvements were evident as early as Week 1 for CTN 200mg and Week 3 for 400mg. Similar reduction in symptom severity per CGI-S was observed for CTN 200mg (ES 0.31) and 400mg (ES 0.25) vs placebo at Week 6.

Conclusions: CTN demonstrated to be efficacious in adults with severe combined presentation of ADHD, showing consistency with overall efficacy in adults with ADHD.

32 - THE RELATIONSHIP BETWEEN ADHD AND QUALITY OF LIFE IN ADULTS: A SYSTEMATIC REVIEW AND META-ANAYLSIS

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Hypothesis/Objective: This systematic review and meta-analysis aimed to evaluate the extent to which ADHD impacts quality of life in adults. We hypothesized that ADHD would be associated with poorer quality of life when compared to controls.

Methods: The authors searched PubMed with parameters (ADHD) AND (Quality of Life) on June 25th, 2024. Included studies demonstrated a cross-sectional evaluation of participants with ADHD compared to controls on validated quality of life measures. Two independent reviewers screened abstracts and reviewed full-text papers. Discrepancies were adjudicated by a third reviewer. Meta-analysis using the Cohen's d measure of effect and random effects models with inverse variance weighting and restricted maximum likelihood estimation determined the standardized effect size (d) of ADHD vs. controls on quality-of- life measures.

Results: This review includes 19 papers with 4,613 cases and 40,201 controls. Overall, those with ADHD reported lower QoL than controls (d=-1.42, 95%CI=-2.51, -0.33). The most common measure of QoL was the Adult ADHD Quality of Life Scale (5 studies; ADHD n=721, Control n=385), for which the standardized effect size was -0.93, 95%CI=-1.28, -0.59. ADHD was associated with poorer QoL when compared to healthy (d=-1.57, 95%CI=2.97, -0.17) and adult ASD control (d=-0.90, 95%CI=-1.29, -0.51).

Conclusions: Adults with ADHD experience a lower quality of life than adults without ADHD. Understanding the impact of ADHD on adult quality of life highlights the need for improved diagnosis and treatment.

33 - THE IMPACT OF COMORBID PSYCHIATRIC DISORDERS AND PSYCHOSTIMULANTS ON MISCONDUCTS AMONG INCARCERATED INDIVIDUALS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER: A PRELIMINARY STUDY

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Hypothesis/Objective: Approximately 25% of inmates meet criteria for ADHD, making this disorder prevalent in prison environments. ADHD is associated with alcohol/substance use disorders, complicating diagnosis and treatment in prison settings. Research has demonstrated that inmates with ADHD tend to engage in more violent and non-violent infractions. Thus, this study aims to examine the impact of comorbid disorders and psychostimulant treatment on misconducts among inmates with ADHD.

Methods: This sample consisted of inmates with ADHD placed at Central North Correctional Centre (CNCC) in Canada (n = 35). The number of misconducts were compared before psychostimulants treatment (2006-2011) to after (2012-2017).

Results: Inmates with comorbid alcohol use disorder (M = 0.82, SD = 1.19) displayed significantly more non-violent misconducts ($t(33) = -2.23$, $p = 0.016$) than non-comorbid inmates (M = 0.17, SD = 0.38). However, after psychostimulants were introduced, there were no group differences observed. Inmates with comorbid cannabis use disorder (M = 0.55, SD = 0.69) committed significantly more violent misconducts ($t(33) = -1.81$, $p = 0.040$) than non-comorbid inmates (M = 0.21, SD = 0.41). This remained consistent after psychostimulant treatment. No significant group differences were found regarding misconducts and cocaine use disorder across periods.

Conclusions: Inmates diagnosed with comorbid alcohol/cannabis use disorder displayed significantly more misconducts, alluding to a worsening in behavioral regulation with the use of such substances. This contrasts with the lack of effects seen in inmates with comorbid cocaine use disorder. Interestingly, psychostimulant treatment appeared to maintain or mitigate the severity of misconducts, suggesting potential benefits from the use of psychostimulants among inmates with ADHD and comorbid alcohol/cannabis use disorder.

34 - A RANDOMIZED, OPEN LABEL, MULTIPLE-DOSE, TWO-WAY STUDY TO EVALUATE BIOAVAILABILITY OF CLONIDINE HCL EXTENDED-RELEASE ORAL SUSPENSION COMPARED TO CLONIDINE HCL EXTENDED-RELEASE TABLETS

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Tris Pharma, Inc.[1]

Hypothesis/Objective: The need for additional ADHD medication options as monotherapy or in combination with stimulants exists, as not all patients respond optimally to stimulants, which are often used as first-line therapies for ADHD. This randomized, open-label, multiple-dose, two-way study was conducted to evaluate the bioavailability of ONYDA XR (clonidine HCl extended-release oral suspension (EROS); Tris Pharma, Inc. Monmouth Junction, NJ) compared to clonidine ER tablets at steady state under fasting conditions.

Methods: Twenty healthy adult males and females were randomly assigned to receive 0.2mg clonidine HCl EROS (0.1mg/mL) once-daily in the evening for 5 days or 0.2mg clonidine ER tablet administered in equal doses of 0.1mg tablets 12 hours apart for 5 days, with a 14-day washout between periods. Plasma concentrations of clonidine at selected time points were measured and pharmacokinetic parameters were determined.

Results: Nineteen healthy adult subjects completed the study, with 20 included in the safety dataset. After administration of a 0.2mg dose of clonidine HCl EROS once daily over 5 days, the peak steady-state plasma concentration (Cmax,ss) was 107.9%, and steady-state relative bioavailability (AUCt,ss) was 97.7% compared with clonidine ER tablet 0.1mg twice daily. Overall, the study medications were well tolerated without serious adverse events.

Conclusions: Clonidine HCl EROS 0.2mg dose once-daily exhibited equivalent peak and total exposure compared to clonidine ER tablet 0.1mg twice-daily for 5 days. Clonidine HCl EROS can potentially fill an important role providing a once-daily, oral suspension, non-stimulant option for the treatment of ADHD.

35 - EXAMINING HETEROGENEITY IN RESPONSE TO MEGATEAM EXECUTIVE FUNCTIONING TRAINING IN ADHD CHILDREN

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University of Toronto & SickKids[1], University of Toronto[2], SickKids[3], University of Toronto & Holland Bloorview Kids Rehabilitation Hospital[4], Center for Addiction and Mental Health[5], The Hospital for Sick Children, University of Toronto[6]

Hypothesis/Objective: MegaTeam is a videogame-based executive functioning (EF) training program co-designed with youth patient-partners. The current study explored primary intervention outcomes and heterogeneity of treatment response on near-transfer and far-transfer outcomes in children with ADHD.

Methods: 186 participants with ADHD ages 6-12 were randomized to MegaTeam EF training (5 weeks) or treatment-as-usual. EFs were measured at baseline, post treatment, and 6 month follow-up. Outcomes included near-transfer effects on inhibitory control (Stop Task) and working memory (N-Back) and far-transfer effects on ADHD traits (Swanson, Nolan, and Pelham: SNAP), EF impairment (Behavior Rating Inventory of Executive Function: BRIEF-2), planning (Tower Task), and academic fluency (Woodcock-Johnson III). Baseline EF, clinical, and performance characteristics will be examined as predictors and moderators of response to treatment.

Results: At 6 months the MegaTeam group showed significant near-transfer treatment effects in inhibition ($d = -0.58$, $p < 0.05$), working memory ($d = 0.23$, $p < 0.05$) and far transfer effects on ADHD symptoms via the SNAP ($d = -0.59$, $p < 0.05$) and EF impairment via the BRIEF-2 ($d = -0.50$, $p < 0.05$). Planning and academic fluency did not significantly improve. Additional findings regarding heterogeneity of response will be available at the time of presentation.

Conclusions: MegaTeam significantly improved inhibition, working memory, ADHD traits, and EF-related impairment at 6 months indicating the potential of MegaTeam as an affordable and engaging intervention for ADHD. Identification of individual factors associated with heterogeneity of treatment response has the potential to improve efficiency in treatment administration for children and youth with EF deficits.

36 - COMPARING THE ACUTE EFFECTS OF A STRUCTURED PHYSICAL ACTIVITY INTERVENTION AND UNSTRUCTURED OUTDOOR FREE PLAY ON PRESCHOOLERS' SELF-REGULATION

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Hypothesis/Objective: Research has demonstrated the promise of physical activity (PA) as a preventive intervention for symptoms of ADHD in early childhood (e.g., Hoza et al., 2015). Self-regulation represents a key area of deficit in ADHD (McClelland et al., 2017). This study examined acute effects of a PA program on preschoolers' self-regulation skills. We hypothesized that preschoolers' self-regulation skills would be significantly greater immediately following a PA intervention as compared to outdoor free play.

Methods: Forty-five preschoolers (48.9% male) participated in this study. Using a within-subjects design, a behavioral measure of self-regulation (Head Toes Knees Shoulders-Revised, HTKS-R; Gonzales et al. 2021) was administered to participants immediately following approximately thirty minutes of a PA program (Kiddie Children and Teachers on the Move [Kiddie CATs], KC) or outdoor free play (FP). The order of administration of the HTKS-R was counterbalanced across PA conditions (i.e., KC and FP).

Results: A repeated-measures ANCOVA was conducted to examine if children's HTKS-R scores varied across the two PA conditions. Age and order of HTKS-R administration were entered as covariates. There was a significant main effect of HTKS-R scores (Table 1). Specifically, children's HTKS-R scores were higher following KC than following FP (Figure 1).

Conclusions: The results of the current study suggest that the Kiddie CATs preschool PA intervention was more immediately effective at promoting children's self-regulation skills than unstructured outdoor free play. Future research should further explore the acute effects of structured PA interventions on self-regulation and related executive function skills that may be associated with ADHD in early childhood.

37 - THE IMPACT OF IRON SUPPLEMENTATION ON RESTLESS LEG SYMPTOMS IN CHILDREN WITH ADHD

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Hypothesis/Objective: ADHD and Restless Leg Syndrome (RLS) often co-occur in children, with up to 44% of children with ADHD exhibiting symptoms of RLS. Iron deficiency has been implicated as an underlying pathophysiological mechanism of both ADHD and RLS in children. While studies have assessed sleep in children with ADHD through actigraphy, few studies have investigated iron supplementation as a treatment for restless sleep in these children. The goal of this pilot study is to assess changes in RLS symptoms over time based on iron supplementation treatment using both self-report and actigraphy measures.

Methods: Nine children (7 female) ages 11 to 16 (Mage=13.48) with ADHD and restlessness during sleep completed three months of oral iron supplementation treatment. Pre- and post-treatment, children completed a modified International Restless Leg Syndrome Rating Scale (IRLSS) and five nights of ankle actigraphy monitoring at home during sleep.

Results: There was a significant improvement with treatment in overall restlessness on the self-report IRLSS ($t(8)=1.890$, $p=.048$). Additionally, there were marginally significant improvements in number of arousals during sleep ($t(8)=1.710$, $p=.063$) as well as periodic limb movements of sleep (PLMS) associated with arousals ($t(8)=1.826$, $p=.053$), measured by actigraphy.

Conclusions: This study is the first of its kind to utilize ankle-monitor actigraphy to measure symptoms of RLS in children with ADHD, pre- and post- iron supplementation treatment. Findings from this study suggest that iron supplementation has the potential to improve RLS symptoms in children with ADHD; however, better powered studies are warranted.

38 - MOVEMENT-RELATED CORTICAL POTENTIALS UNDERLYING MOTOR PREPARATION AND EXECUTION IN CHILDREN WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

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Hypothesis/Objective: Approximately 50% of children with attention-deficit/hyperactivity disorder (ADHD) also display motor difficulties that are consistent with developmental coordination disorder (DCD). Although coexisting ADHD+DCD symptomatology is associated with greater functional impairment than either disorder alone, it is not well understood whether ADHD and DCD have shared or separate etiologies. In particular, it remains unknown whether motor difficulties occur during movement preparation, execution, or both.

Methods: Sixty-six children with ADHD and 30 typically developing (TD) children (7–11 years) completed event-related potential (ERP) recordings and neuropsychological testing, including a visual-motor integration (Beery VMI) test. Movement-related cortical potentials (MRCPs) were extracted during two ERP tasks. We tested (1) whether children with ADHD have atypical MRCPs during movement preparation and/or execution, and (2) whether MRCPs related to VMI performance and ADHD diagnosis are separate or shared.

Results: In both ERP tasks, children with ADHD were significantly less accurate and displayed attenuated correct trial MRCP amplitudes at a fronto-midline electrode during movement preparation but not execution. Greater ADHD symptom severity was associated with reduced VMI scores, over and above age and IQ. ADHD diagnosis and reduced error trial MRCPs each explained unique variance in VMI performance. In contrast, attenuated correct trial MRCPs were associated with ADHD diagnosis.

Conclusions: Compared to TDs, children with ADHD display atypical MRCPs during movement preparation but not execution. Additionally, distinct cortical processes are linked with VMI performance and ADHD diagnosis, providing support for the separate etiology hypothesis. Comorbidity between ADHD and DCD is likely due to a combination of behavioral and neurobiological vulnerabilities.

39 - EFFECT OF CENTANAFADINE ON THE AIM-A AFTER 6 WEEKS OF TREATMENT IN ADULTS WITH ADHD: A POOLED ANALYSIS OF TWO PHASE 3 TRIALS

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Hypothesis/Objective: ADHD is a chronic and prevalent neurodevelopmental disorder in adults, characterized by symptoms of inattention, hyperactivity, and impulsivity. This pooled analysis of 2 phase 3 trials evaluated the effect of centanafadine (CTN)—a norepinephrine, dopamine, serotonin reuptake inhibitor—on the quality of life (QoL) of adults with ADHD.

Methods: Data from 2 identically designed phase 3 trials were pooled. Eligible patients aged 18-55 years with a primary ADHD diagnosis per DSM-5 were randomized to receive CTN 200 or 400mg/day or placebo. Exploratory endpoints included change from baseline in ADHD Impact Module-Adult (AIM-A), a self-reported QoL assessment, at Week 6. Endpoints were analyzed using a mixed-effects model for repeated measure without adjusting for multiplicity and are therefore descriptive.

Results: Overall, 859 adults (mean age 35y, 52% male) were randomized to CTN 200mg (n=287), CTN 400mg (n=287), or placebo (n=285). CTN demonstrated clinically meaningful improvement on the AIM-A multi-item summary scores vs placebo. For CTN 200 and 400mg, the treatment difference vs placebo in summary scores of Living With ADHD was 4.43 and 3.79 (both $P<0.001$), respectively; General Well-Being was 5.27 ($P<0.0001$) and 3.56 ($P<0.005$); Performance and Daily Functioning was 8.45 ($P<0.0001$) and 6.62 ($P<0.0002$); Impact of Symptoms: Bother/Concern was 8.19 ($P<0.0001$) and 5.44 ($P<0.0009$). Similar clinically meaningful improvement was observed on the global QoL items for CTN vs placebo, including Current QoL, Global Limitations, and More Good Days Than Bad Days.

Conclusions: Treatment with CTN is associated with clinically meaningful improvement on core health-related QoL domains in adults with ADHD.

40 - COMPARISON OF CAREGIVER EXIT SURVEY WITH EFFICACY MEASURES IN THE TREATMENT OF ATTENTION-DEFICIT/HYPERACTIVITY DISORDER WITH CENTANAFADINE IN A PEDIATRIC POPULATION

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Hypothesis/Objective: To compare efficacy measures and the patient exit survey of a pediatric population treated with centanafadine (CTN)—a norepinephrine, dopamine, serotonin reuptake inhibitor—for ADHD.

Methods: Two phase 3 trials (NCT05428033 & NCT05257265) evaluated the efficacy and safety of once-daily extended-release CTN for ADHD treatment (aged 6-12y and 13-17y, respectively). Patients were randomized (1:1:1) to high-dose CTN, low-dose CTN, or placebo for 6 weeks; dosing for children (6-12y) was weight-based. Efficacy endpoints included changes from baseline in ADHD-RS-5 symptoms total raw score, CGI-S, and PGI-S (analyzed using a mixed-effect model for repeated measures) and CGI-C (analyzed using a Cochran-Mantel-Haenszel test). Caregivers completed the exit survey at trial conclusion and values reflect those who selected either somewhat or much better.

Results: In both trials, high-dose CTN demonstrated greater differences at Week 6 in the primary endpoint (change from baseline in ADHD-RS-5) and secondary endpoints (CGI-S, PGI-S, and CGI-C) when compared to placebo. Per the caregiver-reported exit survey, of those treated with high-dose CTN, 75% (vs 49% placebo) of adolescents and 59% (vs 50% placebo) of children saw improvement in ADHD symptoms. Similarly, 62% (vs 42% placebo) of adolescents and 56% (vs 45% placebo) of children saw improvement in behavior at home and 47% (vs 27% placebo) of adolescents and 47% (vs 38% placebo) of children saw improvement in behavior at school.

Conclusions: Consistent with efficacy measures, caregiver-reported perceptions of ADHD symptom improvement and better behavior at home/school were observed at Week 6 following CTN treatment.

41 - EFFICACY OF CENTANAFADINE ON CONNERS 3 CONTENT SCALES IN ADOLESCENTS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

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Hypothesis/Objective: To evaluate the treatment impact of centanafadine (CTN)—a norepinephrine, dopamine, serotonin reuptake inhibitor—on hyperactivity/impulsivity (H/I), inattention, and executive functioning (EF) via caregiver proxy and/or self-report in adolescents with ADHD.

Methods: This phase 3 trial (NCT05257265) evaluated efficacy and safety of once-daily extended-release CTN for ADHD treatment in adolescents (N=451; aged 13–17y). Participants received CTN 328.8mg, 164.4mg, or placebo for 6 weeks. Additional efficacy outcomes were the Conners 3-Parent Short (PS; caregiver perspective) and Conners 3-Self-Report Short (Conners 3-SRS) H/I, inattention, and EF content scale T-scores at Week 6. Values are LS mean change from baseline (standard error); analyzed using a mixed-effect model for repeated measures. P-values were not controlled for multiplicity and are descriptive.

Results: Improvements in H/I were observed for CTN 328.8mg vs placebo on Conners 3-PS (−14.0 [1.1] vs −8.5 [1.1], P=0.0002) and Conners 3-SRS (−11.6 [0.9] vs −8.9 [0.9], P=0.0282). Improvements in inattention were observed per Conners 3-PS for CTN 328.8mg vs placebo (−14.4 [1.0] vs −8.1 [1.0], P<0.0001) and Conners 3-SRS (−15.3 [1.1] vs −10.0 [1.0], P=0.0001). Similarly, improvements in EF were observed for CTN 328.8mg vs placebo on Conners 3-PS (−13.0 [1.0] vs −8.1 [1.0], P=0.0003); Conners 3-SRS was not utilized for the EF content scale.

Conclusions: CTN 328.8mg showed improvements in H/I, inattention, and EF symptoms in adolescent patients when compared to placebo, with both greater caregiver and adolescent perceptions of symptom improvement.

42 - POST-HOC ANALYSIS OF LABORATORY CLASSROOM STUDY EFFICACY AND SAFETY DATA FOR PRC-063 BY GENDER IN ADULTS AND CHILDREN WITH ADHD

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Hypothesis/Objective: To conduct a post-hoc analysis of clinical data for PRC-063 (methylphenidate hydrochloride controlled-release capsules) in adults and children with ADHD, focusing on treatment response, optimized daily dose and adverse events by gender.

Methods: Data on age, ADHD-Rating Scale response, optimized dose, SKAMP, PERMP, and adverse events were summarized by patient-reported gender for both adults (18 years and older) and children (aged 6-12 years old) with ADHD from two separate double-blind, randomized laboratory classroom studies.

Results: Data for 131 male (mean age 31.6 ± 10.36) and 157 female (mean age 34.5 ± 10.95) adults, and 102 male (mean age 9.5 ± 1.82) and 54 female (mean age 9.4 ± 2.01) children were analyzed. Observed improvements in the ADHD-Rating Scale following treatment with PRC-063 were similar between male and female adults as well as male and female children. Following dose optimization, mean daily dose of PRC-063 was similar for male (66.4 ± 19.16 mg/day) and female (68.8 ± 19.92 mg/day) adults and for male (48.7 ± 15.13mg) and female (46.7± 14.97mg/day) children. SKAMP data also showed a similar time-course of treatment response independent of gender for both age groups. Adverse event frequencies for adults and children were similar between genders.

Conclusions: When clinical data was summarized by gender, male and female participants were of similar age and baseline ADHD severity. Both male and female participants had similar optimized daily doses of PRC-063 and had similar improvements in ADHD symptomatology. The gender of study participants did not lead to a differential response to PRC-063.

43 - REAL-WORLD UTILIZATION OF DELAYED-RELEASE/EXTENDED-RELEASE METHYLPHENIDATE: DEMOGRAPHIC AND DOSING DATA FROM A LARGE US CLAIMS DATABASE ANALYSIS

*Friedrich Weddige[1], Vamshi Ruthwik Anupindi[2], Swapna Munnangi[2], Yifan Gu[2], Mitchell DeKoven[2], Michelle Po, PhD[1], Cassandra Uchida[1], Lewis Warrington, MD[1]

Ironshore Pharmaceuticals Inc [1], IQVIA Health Economics & Outcomes Research – Real World Insights[2]

Hypothesis/Objective: JORNAY PM® is the first evening-dosed delayed-release and extended-release methylphenidate (DR/ER-MPH) for individuals ≥6y with ADHD. Absorbed in the colon, it has no immediate-release component and is predicted to provide a dose-dependent duration of effect.

Methods: Patients ≥4y newly prescribed DR/ER-MPH between July 2019 and August 2022 with ≥12-months follow-up were identified using IQVIA's US professional fee and prescription claims databases. Data were de-identified and HIPAA compliant; therefore, IRB review was not required. Demographic/clinical data included age, sex, comorbidities, and prior ADHD medication. Age-stratified data including initial and stable strength (≥2 consecutive strength prescriptions) were collected for patients with ≥4 DR/ER-MPH prescriptions.

Results: A total of 5,501 patients (mean age: 20.2y; 55% male) were included; 17.4% and 24.1% had experience with amphetamine and methylphenidate, respectively, in the prior six months. Most common psychiatric comorbidities were anxiety disorders (26.3%), mood disorders (19.3%), autism spectrum disorder (6.7%), and oppositional defiant disorder (6.7%). For patients with ≥4 DR/ER-MPH prescriptions (N=2,831), mean starting strength was 33.2 mg and 60.2% initiated at 20 mg; mean strength increased to 49.4 mg by prescription four. A total of 98.7% of patients achieved a stable strength (mean: 54.5 mg at 99.3 days).

Conclusions: These real-world data demonstrate DR/ER-MPH utilization in patients aged ≥4y with psychiatric comorbidities. However, in clinical practice, mean stable strength was lower than the average optimal dose in clinical trials (66.2 mg/day) where participants aged 6–12y achieved significant and clinically relevant improvements in ADHD symptoms and functional impairment from waking to bedtime.

44 - INVESTIGATING THE SAFETY, EFFICACY, AND TOLERABILITY OF ADJUNCTIVE CARIPRAZINE TREATMENT IN ADULTS WITH ADHD: A PRELIMINARY STUDY

*Alexandria Greifenberger[1], Elssa Toumeh[1], Kathryn Fotinos[1], Tia Sternat[1], Irvin Epstein[1], Martin Katzman[1]

START Clinic for Mood and Anxiety Disorders[1]

Hypothesis/Objective: Many patients with complex and severe ADHD experience sub-optimal benefits with psychostimulant treatment and may require alternative psychotropic medications that target the remaining debilitating symptoms of ADHD. As an atypical antipsychotic acting as a partial agonist at D2 and D3 receptors, cariprazine may have the potential to increase DA activity and improve ADHD symptoms. Therefore, this study aimed to examine whether adjunctive treatment of cariprazine would increase the efficacy of standard psychostimulant treatment in patients with ADHD who had an inadequate response to psychostimulants alone.

Methods: Subjects (N=10) included adult psychiatric outpatients (Mage = 42.80, SD = 11.22) previously diagnosed with ADHD, with or without secondary comorbidities in this pilot study. Participants were administered 1.5mg of cariprazine daily for the first week of the study and flexibly titrated up to a maximum of 3mg/day.

Results: Results from paired samples t-tests showed significant improvements in BAARS-IV scores, $t(9) = 2.46$, $p = 0.036$, ASRS scores, $t(9) = 1.88$, $p = 0.046$, CGI-S scores, $t(8) = 3.41$, $p = 0.005$, visuospatial working memory, $t(6) = -2.56$, $p = 0.021$, episodic memory, $t(6) = -3.09$, $p = 0.011$, and response inhibition, $t(6) = -2.53$, $p = 0.022$, between baseline measures and post-treatment.

Conclusions: Results from this preliminary study suggest adjunctive treatment of cariprazine may be efficacious in reducing residual ADHD symptoms, lessen clinical severity of global mental illness, and enhance cognitive functioning among individuals with ADHD. Thus, future studies should investigate the mechanisms underlying cariprazine treatment through the normalization of DA activity.

45 - FROM TRAUMA TO THRILL: DOES CHILDHOOD ADVERSITY FUEL IMPULSIVE AND RISKY BEHAVIORS IN COLLEGE STUDENTS WITH ADHD AND AUTISM?

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Hypothesis/Objective: College students with ADHD and Autism both engage in risky behaviors (e.g., unprotected sex, binge drinking), yet no research has considered the comorbid state. This study aims to understand associations between emotional impulsivity, risky behaviors, and adverse childhood experiences (ACEs) in college students with comorbid ADHD+Autism.

Methods: College student participants (n = 4408) were recruited from eight geographically diverse colleges in the United States. Participants completed standardized and validated measures of ACEs, emotional impulsivity, risky behaviors, and reported diagnoses of ADHD and Autism. A hierarchical regression was used to determine predictors of risky behaviors.

Results: Emotional impulsivity was lowest in the comparison group and highest in the ADHD+Autism group. The comorbid group was also higher in ACEs and risky behaviors. In the overall sample, emotional impulsivity and risk were moderately associated, r = .323. Emotional impulsivity and ACEs predicted risky behavior in the comorbid and Autism groups.

Conclusions: Students with ADHD+Autism reported higher levels of emotional impulsivity, ACEs, and risky behaviors. Emotional impulsivity and ACEs predicted risky behavior in the Autism and ADHD+Autism groups. ACEs in students with Autism and ADHD+Autism is a risk factor for engagement in risky behaviors and may be used by college health professionals to inform interventions targeted to decrease risky behavior.

46 - NORMATIVE DATA FOR OBJECTIVE ADHD SMARTPHONE APPLICATION IN A MULTI-NATIONAL GENERAL POPULATION

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Qbtech[1]

Hypothesis/Objective: To establish normative demographic data for QbMobile, a software application for the administration of a performance test identical to the QbTest to provide objective measurements of hyperactivity, inattention and impulsivity in the clinical assessment of ADHD, in a representative general population sample across Europe and US.

Methods: The QbMobile application was pre-installed on the smart device/iPhone, and the participants were instructed to sit holding the smartphone with both hands and to tap the screen each time a

target stimulus appears on-screen, and to withhold tapping the screen to all other stimuli. Simultaneously, the smartphone tracked the participants' movements with the camera and movements of the smartphone to measure activity. Participants between 6-60 years were included.

Results: The study was conducted in US, the United Kingdom, The Netherlands and Germany. Demographic data were collected in a general population (N=2541) and there were 326 participants in the age range 6-11 years and 2215 participants in the age range 12-60 years. There were more females (55.7%) than males (44.3%) included. Demographic variables (sex, age, race, ethnicity) had no impact on the data collected. Household income and educational levels were investigated to ensure a sufficient spread, and income level was compared to national averages. The basic parameters of QbMobile were captured and evaluated during the assessment. 93.6% of users reported that the application was easy to use, with a high degree of acceptance.

Conclusions: The normative data from the QbMobile provides an extensive and balanced representation across socio-economic class, demographics and in different environmental settings.

47 - DEPRESSION PARTIALLY MEDIATES THE ADHD-EXECUTIVE FUNCTIONING RELATIONSHIP

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Hypothesis/Objective: Attention-deficit hyperactivity disorder (ADHD) and mood disorders such as depression have long shared high comorbidity rates, ranging as high as 89% (Sobanski, 2006). Because ADHD and depression share similar symptoms related to executive functioning—such as forgetfulness, distractibility, and fatigue—studies have examined their combined effect on executive functioning (Coutinho et al., 2021; Souza et al., 2001). However, the specific effect of depressive symptoms on the neuropsychological function of young adults with ADHD has yet to be addressed. The objective of this research was to explore the effect of depressive symptom severity on the relationship between ADHD symptomatology and executive functioning.

Methods: Participants for this study included 29 college students with ADHD who completed the Beck Depression Inventory, Second Edition (BDI-II), the Wender Utah Rating Scale (WURS), and the Behavior Rating Inventory of Executive Function – Adult Version (BRIEF-A) among a larger battery of tests in a lab setting. The clinical sample (M age = 23.76, SD = 8.70; 62.1% self-identified females) was recruited from local university disability offices, where they receive academic accommodations for their classes. Data were analyzed using Hayes PROCESS V.4 model 4 mediation.

Results: The initial analysis showed a significant total effect of WURS on BRIEF-A ($b = .85$, $t(27) = 4.23$, $p = <.001$). When BDI-II was included in the model, the direct effect of WURS on BRIEF-A was lessened ($b = .55$, $t(26) = 2.97$, $p <.05$), indicating that that depression partially mediated the relationship between childhood ADHD symptoms (WURS) and current executive functioning (BRIEF-A). The indirect effect through BDI-II was significant ($b = 0.30$, $SE = 0.16$, 95% CI [.0226, .6651].

Conclusions: The results support that a portion of the relationship between retrospectively reported ADHD symptoms and current executive functioning is explained by the severity of depression. In clinical practice, clinicians should screen for comorbid depression to implement early and targeted interventions for mood-related symptoms that may contribute to executive difficulties in day-to-day life. Future research aims to generalize these findings to a larger college-student population and analyze ADHD symptomatology in relation to quality of life, a domain often negatively affected by mood disorders and executive difficulties.

48 - REAL-WORLD PERSISTENCE AND ADHERENCE WITH DELAYED-RELEASE/EXTENDED-RELEASE METHYLPHENIDATE FROM A LARGE US CLAIMS DATABASE ANALYSIS

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Collegium Pharmaceuticals[1], Ironshore Pharmaceuticals Inc.[2], IQVIA Health Economics & Outcomes Research – Real World Insights[3]

Hypothesis/Objective: JORNAY PM®, approved for individuals ≥6 years with ADHD, is an evening-dosed, delayed-release and extended-release methylphenidate (DR/ER-MPH) absorbed in the colon and predicted to provide a dose-dependent duration of effect. This retrospective analysis evaluated real-world persistence and adherence among patients initiated on DR/ER-MPH, 13 branded long-acting (LA) MPHs, or 8 generic LA MPHs over a 12-month period.

Methods: Patients from IQVIA's US professional fee and prescription claims databases were included if they were first prescribed DR/ER-MPH (n=5,501), branded LA MPH (n=152,504) or generic LA MPH (n=445,760) between July 2019 and August 2022 with ≥12 months of follow-up. Individuals were considered persistent over 12 months if they did not discontinue (a gap without medication equal to the duration of the last prescription) their index ADHD medication. Adherence was evaluated among persistent patients using Proportion of Days Covered (PDC). Adherence and persistence by treatment were compared using multivariate logistic regression.

Results: The 12-month persistence rate was 24.4%, 16.5%, and 20.6% in the DR/ER-MPH, branded LA MPH, and generic LA MPH cohorts, respectively. Branded and generic LA MPH had lower odds of persistence vs. DR/ER-MPH (odds ratio [OR]=0.566 and 0.758, respectively, both P<0.0001). Among persistent patients, adherence rate (patients with PDC ≥80%) was 85.5%, 74.6%, and 78.7% for DR/ER-MPH, branded LA MPH and generic LA MPH, respectively. Branded and generic LA MPH had lower odds of adherence vs. DR/ER-MPH (OR=0.496 and 0.679, respectively, both P<0.0001).

Conclusions: This large database analysis demonstrated significantly better persistence and adherence over 12 months with DR/ER-MPH compared to other LA MPHs.

49 - SCHOOL ABSENTEEISM AMONG CLINICALLY-REFERRED YOUTH WITH ADHD: A MACHINE LEARNING APPROACH

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Hypothesis/Objective: Despite the extensive research documenting the academic adversities associated with ADHD, far less research with this population has focused on school attendance– a critical ingredient of academic success and a key social determinant of health. Using data from a clinical sample of youth with ADHD, the current study aimed to develop an algorithm using machine learning techniques to accurately classify those with a history of chronic school absenteeism.

Methods: The data were derived from an intake questionnaire developed by a partnering ADHD clinic. Participating parents/legal guardians of 198 children and adolescents with ADHD completed the form together with a clinic case worker and answered questions about demographic variables, history of school absenteeism, and bio-psycho-social-educational risk factors.

Random forest regression, a type of machine learning, was used to analyze the data. This analysis first organized a subset of the risk items into a decision tree that could best predict school absenteeism. However, using only one tree has several limitations, including the tree being specific to a single dataset or vulnerable to outliers. To address this, the analysis repeated this step 500 times, each time using a unique subset of problem items, to ultimately create a forest of decision trees. Combining the predictions of all of these trees gave us the prediction of the forest, in other words, the best and most comprehensive prediction of absenteeism overall.

Results: Results suggested that this algorithm achieved 78% accuracy in classifying risk of school absenteeism incur sample of children with ADHD. The presence of Interfering Behavior at School, Depressed Mood or Thoughts, and Inconsistent Parenting were most important items to consider in accurately predicting a history of school absenteeism.

Conclusions: Despite prior work highlighting increased rates of school absenteeism among youth with ADHD, methods to identify those at risk remain lacking, particularly in clinical settings. By developing an algorithm using machine learning techniques, we accurately classified school absenteeism among youth with ADHD with high accuracy. By identifying the most important risk factors associated with school absenteeism, this study can inform schools and clinics to help identify factors and patterns within a youth's life that increase their risk of chronic school absenteeism.

50 - ACADEMIC ACHIEVEMENT IN CHILDREN WITH ADHD: THE MEDIATING ROLE OF PROCESSING SPEED AND WORKING MEMORY

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Hypothesis/Objective: Academic underachievement is often reported in children with attention-deficit/hyperactivity disorder (ADHD). Research shows both working memory (WM) and processing speed (PS) have a predictive role in their academic difficulties. However, recent evidence suggests both cognitive functions are related, where slower PS underlies WM deficits. This relationship is not accounted for in the current literature on academic underachievement in children with ADHD. In the current study, PS and WM are investigated as serial mediators in the relationship between ADHD symptom severity and academic achievement. Academic achievement is thereby assessed across three academic subjects (i.e., mathematics, reading, and spelling), integrated across three measurement methods (i.e., standardized cognitive tests, parent rating, and teacher rating).

Methods: A large sample of 417 children with a confirmed DSM-5 diagnosis of ADHD, aged 6 to 12 years old, is included in the current study. For all children, data on the necessary cognitive tests and questionnaires was available. The (serial) mediating role of PS and WM in the association between ADHD symptom severity and academic achievement is investigated, using structural equation modeling (SEM). The model is fitted separately for symptoms of inattention and hyperactivity/impulsivity. Age was included as predictor in the model.

Results: The association between inattention symptom severity and academic achievement was (partially) mediated by PS and WM sequentially, for all academic subjects. For spelling performance, PS was also a single mediator in this association. PS fully mediated the relation between inattention symptom severity and WM performance. Hyperactivity/impulsivity symptom severity significantly predicted mathematics performance only. No other direct or mediating effects related to this symptom domain were significant. Mathematics performance significantly declined with increasing age, even though tests for academic achievement were grade standardized.

Conclusions: The current findings show PS plays an important role in academic achievement in children with ADHD, and in the WM deficits as often reported in this population. These findings have important implications for theoretical accounts of WM deficits in ADHD. It also highlights the importance to investigate the relation with PS in future research. Additionally, it raises the potential of targeting PS in academic interventions for children with ADHD, which currently focus on WM deficits.

51 - IMPROVING THE EVALUATION OF OVER 150,000 VETERANS WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER

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Yale [1], Northeast Program Evaluation Center, VA Office of Mental Health[2], VA Pharmacy Benefits Management, Academic Detailing Services [3], VA Puget Sound Healthcare System[4], VA Finger Lakes Healthcare System[5], VA Portland Healt

Hypothesis/Objective: A diagnostic template for the Veteran Health Administration (VHA) electronic medical record (EMR) was developed to improve the evaluation and management of Veterans with Attention Deficit Hyperactivity Disorder (ADHD). This quality improvement analysis evaluated the frequency, clinical context, and consistency of template use.

Methods: The "Focused ADHD Diagnostic Template" contains sections on ADHD history, use of validated scales, DSM-5-TR diagnostic criteria, and description of the diagnosis. Data from all patient records utilizing the template between February 2023 and August 2024 were obtained. Veteran, provider, clinic, and facility data were evaluated to determine the context of use. Both template completion and consistency between the criteria selected and diagnosis made were evaluated.

Results: There were 60,291 Veterans with incident ADHD diagnoses over the evaluation period, and the template was used in 1,934 Veterans (3.2%). The template was used in 68.6% of VHA facilities, primarily by licensed practitioners (88.3%) in mental health treatment contexts (98.1%). In 98.6% of templates, the ADHD history, diagnostic criteria, and diagnosis sections were competed. Additionally, 53.8% of templates used a validated scale. Selected diagnostic criteria were inconsistent with the diagnosis made in 16.7% of templates.

Conclusions: In the first 1.5 years of use, an EMR template supporting the evaluation of ADHD was used broadly across VHA facilities in a small but increasing number of Veterans. While most templates were fully completed, diagnostic criteria selected were inconsistent with the diagnosis made in over 15%. There are numerous reasons for these inconsistencies, and further exploration is needed.

52 - THE ROLE OF EXTRACURRICULAR PARTICIPATION IN RELATION TO PSYCHOLOGICAL WELL-BEING AND SOCIAL FUNCTIONING IN ADOLESCENTS WITH ADHD

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Hypothesis/Objective: ADHD can have significant adverse effects on mental health, peer relationships, social skills, and overall well-being. Given these challenges, it is essential to explore protective factors that support youth with ADHD. One such factor is participation in extracurricular activities, which includes both structured and unstructured activities that adolescents engage in before, during, or after school. These activities play a critical role in promoting mental health and well-being. Although prior research has demonstrated that extracurricular participation fosters desirable outcomes (e.g., increasing high school graduation rate, decreasing delinquent behavior), there has been limited attention to its relationship with indicators of positive youth development. Moreover, very few studies have examined the role of extracurricular activities in relation to the well-being and functioning of adolescents with ADHD. This study aims to examine the relationship between frequency of extracurricular participation and youth well-being, social adaptive behavior, and internalizing symptoms in a racially diverse group of adolescents with ADHD. Additionally, it will explore how specific types of extracurricular activities differentially relate to these outcomes.

Methods: This study utilizes data from the sixth wave of the Future of Families and Child Wellbeing Study (FFCWS). Participants included 588 adolescents (14-18 years old at time of interview; Mage = 15.61) with a previous diagnosis of ADHD (72.4% male; 48% Black, 24.1% White, 19.4% Latino/a/e).

Results: Above and beyond race, sex, and caregiver-reported overall global impairment, regression analyses showed that more frequent participation in adolescent-reported extracurricular activities predicted higher self-reported youth well-being ($\beta = .132$, $p < .05$) and higher self-reported socially adaptive behavior ($\beta = .222$, $p < .001$). Participation in extracurricular activities did not predict self-reported internalizing symptomatology. Next, follow-up path analyses were conducted to explore the differential impact of extracurricular type. Participation in volunteer activities predicted higher well-being ($\beta = .147$, $p < .05$) and socially adaptive behavior ($\beta = .201$, $p < .001$). Participation in religious services also predicted higher socially adaptive behavior ($\beta = .099$, $p < .05$). Interestingly, participation in school activities predicted higher self-reported depressive symptoms ($\beta = .109$, $p < .05$) but lower anxiety symptoms ($\beta = -.123$, $p < .05$).

Conclusions: The findings suggest that increased participation in extracurricular activities enhances well-being and social functioning, even when accounting for the global impairment linked to an ADHD diagnosis. However, it's notable that the frequency and type of extracurricular activities did not protect against mood symptoms. Future research should explore the mechanisms through which extracurricular involvement promotes well-being in the context

of ADHD-related risks. Additionally, longitudinal studies are essential to understanding the long-term effects of extracurricular participation on outcomes.

53 - ADDRESSING THE GAP IN ADHD TREATMENT: THE IMPACT OF STATE HEALTH POLICIES RESTRICTING NURSE PRACTITIONERS' PRESCRIPTIVE AUTHORITY

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UT Health San Antonio[1]

Hypothesis/Objective: This presentation aims to highlight treatment gaps and policy barriers preventing PMHNPs from effectively treating ADHD and demonstrate the public health impact of advocating for health policy reform.

Methods: The literature was reviewed to examine evidence-based guidelines and best practices for ADHD treatment, state regulations governing NPs' authority to prescribe schedule II medications (stimulants), and the public health impact of ADHD across the lifespan.

Results: The results highlight significant gaps in ADHD treatment due to restrictive state policies preventing PMHNPs in Texas, Oklahoma, Missouri, Georgia, and Alabama from prescribing stimulants, the recommended first-line treatment for ADHD across the lifespan. These five states rank among the lowest in access to mental health care, with Texas ranked last. Clinical guidelines emphasize the importance of stimulant medications for effective ADHD management, yet 17% of the U.S. population resides in areas where treatment aligned with these guidelines is inaccessible. Untreated ADHD has profound negative impacts, including emotional, academic, social, and occupational challenges across all life stages, underscoring the need for policy reform to improve patient outcomes.

Conclusions: Expanding PMHNPs' prescriptive authority to include stimulants in restrictive states is essential to bridging treatment gaps and improving access to evidence-based ADHD care. Such reforms can address the significant public health impacts of untreated ADHD, including emotional, academic, and occupational challenges across the lifespan. Collaboration among healthcare providers, ADHD advocacy organizations, and policymakers is crucial to enacting these changes and ensuring equitable and effective ADHD treatment. This will ultimately enhance patient outcomes and reduce long-term societal costs.

54 - 10 HEALTH INSIGHTS THAT COULD TRANSFORM ADHD CARE FOR WOMEN

*Ann Rodgers[1]

WebMD[1]

Hypothesis/Objective: The DSM-5 excludes key characteristics specific to the expression of ADHD in women, such as “decreased self-esteem, more difficulty in peer relationships, increased likelihood of anxiety and other affective disorders,” and more.1 As Andrea Chronis-Tuscano, Ph.D., notes, “Our theories and clinical approach to ADHD were largely guided by studies on elementary school-aged boys.”3 How does this dearth of research impact care and wellbeing for women with ADHD? ADDitude readers told us.

Methods: ADDitude asked the question, “What areas of research would most significantly impact your life as a woman with ADHD?” to 160,000 opt-in subscribers to our Women with ADHD newsletter, 705 of whom answered in Survey Monkey. A dozen clinical experts also answered the question, “What are the top three areas of research that are missing, and that are critical, in creating better understanding, diagnosis and treatment of women and girls with ADHD?” In addition, ADDitude surveyed 5,479 female readers about ADHD in menopause and 2,074 about ADHD throughout the lifespan to gain in-depth insights.

Results: Gaping holes in research have led to real-life risks and impediments for countless women with ADHD. More gender-based studies are clearly needed, and ADDitude readers and advisors recommend beginning with these 10 research priorities:

#1: Longitudinal Studies of Sex Differences in ADHD

#2: Studies on the Mental and Physical Health Consequences of Delayed ADHD Diagnoses on Women

#3: Studies Investigating How Hormonal Changes Across the Lifespan Impact ADHD Symptoms in Women

#4: Studies Investigating How Perimenopause and Menopause Impact ADHD Symptoms, and Vice Versa

#5: Studies Investigating Why Women with ADHD Experience PMS, PMDD, and PPD at Significantly Elevated Rates

#6: Studies Exploring Whether ADHD Medication Use is Safe and Protective to Parents During Pregnancy and While Nursing

#7: Studies Exploring How ADHD Medication Adjustments During the Monthly Menstrual Cycle Could Improve Outcomes for Women

#8: Studies on the Long- and Short-Term Implications of Hormonal Birth Control and Hormone-Replacement Therapy Use Among Women with ADHD

#9: Studies Investigating How and Why Comorbid Conditions Like Anxiety, Depression, and Eating Disorders Impact Females with ADHD

#10: Studies to Identify Early Indicators of Self-Harm, Partner Violence, Substance Abuse, and Other Adverse Outcomes Common Among Women with ADHD

Conclusions: We know that women with ADHD experience more psychological distress, anxiety, depression, insomnia, and eating disorders than their male counterparts. Girls have more visits to a psychiatric care facility prior to ADHD diagnosis, are prescribed non-ADHD medications (e.g., antidepressants) before and after diagnosis at a higher rate, and are older than boys at time of referral and at age of diagnosis. They are also more likely than males with ADHD to suffer with low self-esteem, self-harming behaviors, poor social relationships, and emotional dysregulation.

Why the gender disparity? Lopsided medical research perpetuates gender stereotypes and ignores fundamental truths about ADHD in women that could unlock superior care. Rather than waiting for medical research to catch up with patient needs, clinicians must educate themselves by using this Top 10 list to understand the vital questions standing between their patients and appropriate care, the insights gleaned to date, and the research priorities that promise to unlock equitable care so that they can anticipate and help resolve their patients' most dire needs.

55 - UNDERSTANDING THE ASSOCIATION BETWEEN ADHD AND RACIAL MICROAGGRESSIONS AMONG BLACK AND LATINÉ COLLEGE STUDENTS

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University of Illinois Chicago[1]

Hypothesis/Objective: We hypothesize that ADHD symptom severity across all domains (inattentive, hyperactive/impulsive, and total) will be associated with increased experience of microaggressions, among both Black and Latiné students. Gender will be explored as a potential moderator.

Methods: Data was collected via a cross-sectional study of college students across eight universities in the US. Students (n=1413; 73% female; Mage=19.4, SD=2.78) who identify as being Black (n=472; 77% female) or Latiné (n=1003; 72% female) were included in analyses.

Results: ADHD symptom severity (i.e., inattentive, hyperactive/impulsive, total) all significantly predicted microaggressions. These associations were significant among Black and Latiné students. Finally, gender did not have a moderating effect on this association among Black or Latiné students.

Conclusions: Our findings are the first to suggest that greater severity of ADHD symptoms is associated with greater experiences of microaggressions among Black and Latiné college students. Findings underscore the importance assessing for microaggressions among individuals of color exhibiting ADHD symptoms. Given the relation between microaggressions and negative mental health outcomes, it may be important to address microaggressions in the context of ADHD treatment.

56 - CAREGIVER PERSPECTIVES ON CULTURAL AND GENERATIONAL INFLUENCES ON ADHD TREATMENT-SEEKING: A REFLEXIVE THEMATIC ANALYSIS

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Hypothesis/Objective: Attention-Deficit/Hyperactivity Disorder (ADHD) affects approximately 7 million children ages 3-17 (11.4%). However, compared to White youth, Black, Hispanic/Latino, and Asian/South Asian youth are less likely to receive a diagnosis, pharmacological treatment, or behavioral interventions for ADHD. These disparities put children of color at greater risk for long-term impairment. Reasons for suboptimal treatment of ADHD among children from communities of color include differences in cultural perspectives on the disorder. We aimed to better understand how cultural and individual differences affect ADHD treatment-seeking in families from diverse racial and ethnic backgrounds.

Methods: Four virtual focus groups were conducted with 11 parents of children ages 5-15 diagnosed with ADHD. Caregivers identified as Black, Hispanic/Latino, Asian/South Asian, and Caucasian. A thematic analysis approach was used to generate codes from focus group transcriptions and define themes.

Results: A thematic map was generated to highlight major themes. Themes included Access to Resources, Stigma and Social Perceptions, Cultural Expectations, and Generational Family Influence. Caregivers reported difficulty accessing clinical care following ADHD diagnosis. Stigmas apparent in community settings, and less severe behavioral presentations often went undiagnosed. Hardships discussing ADHD with family were reported when it was seen as culturally unacceptable, contributing to delayed treatment. Finally, older relatives' limited understanding led to misattributions of ADHD to poor parenting.

Conclusions: Individual and cultural factors created barriers to optimal clinical care for pediatric ADHD, including challenges related to treatment access, and cultural stigma. Generational differences in perspectives on parenting and mental health also contribute to treatment disparities among youth with ADHD.

57 - A POST HOC ANALYSIS EVALUATING THE BASELINE CHARACTERISTICS THAT FACILITATE EARLY IDENTIFICATION OF THOSE WHO ARE LIKELY TO RESPOND TO CENTANAFADINE AT WEEK 6

*Lenard Adler[1], Dorothee Oberdhan[2], Caroline Ward[2], Zhen Zhang[2], Taisa Skubiak[2], Lenard Adler[1]

NYU School of Medicine[1], Otsuka Pharmaceutical Development & Commercialization, Inc. (OPDC)[2]

Hypothesis/Objective: Large-scale studies have demonstrated the efficacy and safety profiles of centanafadine (CTN) in adults with ADHD. This pooled analysis evaluated the baseline characteristics of adults with ADHD who were more likely to respond to CTN—a norepinephrine, dopamine, serotonin reuptake inhibitor—by Week 6.

Methods: Data from 2 identically designed phase 3 trials were pooled. Eligible patients aged 18–55 years with a primary ADHD diagnosis were randomized to CTN 200 or 400mg/day or placebo. Responders were defined as individuals with a ≥50% AISRS total score improvement or a 1- or 2-point change on the Clinical Global Impression-Change (CGI-C) at Week 6. Endpoints were analyzed using a mixed-effects model for repeated measures, Cochran-Mantel-Haenszel association test, and Pearson's correlation without adjusting for multiplicity.

Results: Of the 859 adults randomized, 28.3% (n=243) were responders at Week 6, and were on average 37 years of age, female (53.9%), White (75.3%), and had a mean AISRS total score of 37.8 at baseline. At Week 6, responder rates for CTN 200 and 400mg were 28.6% ($P<0.0497$) and 33.4% ($P<0.0032$), respectively, vs placebo (22.8%). Univariate and multivariate analysis using a multiple regression model identified 20 variables ($P<0.1$) for CTN 200mg and 49 variables for CTN 400mg to be predictive of Week 6 response. One variable consistent across both CTN doses was Week 2 response.

Conclusions: Adults treated with CTN demonstrated higher response rates vs placebo at Week 6, with Week 2 response being a consistent predictor of Week 6 response.

58 - IMPACT OF INTRINSIC FACTORS ON THE EFFICACY OF CENTANAFADINE IN AN ADULT POPULATION WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

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Hypothesis/Objective: ADHD is a chronic and prevalent neurodevelopmental disorder in adults, characterized by symptoms of inattention, hyperactivity, and impulsivity. This pooled analysis evaluated the impact of intrinsic factors on the efficacy of centanafadine (CTN)—a norepinephrine, dopamine, serotonin reuptake inhibitor—in adults with ADHD.

Methods: Data from 2 identically designed phase 3 trials were pooled. Eligible patients aged 18-55 years with a primary ADHD diagnosis per DSM-5 were randomized to receive CTN 200 or 400mg/day or placebo. Efficacy endpoints included changes from baseline in Adult ADHD Investigator Symptom Rating Scale (AISRS) total score and Clinical Global Impression–Severity (CGI-S) for ADHD at Week 6. Subgroups were defined by sex, race, and ethnicity. Endpoints were analyzed using a mixed-effects model for repeated measures without adjusting for multiplicity and are therefore descriptive.

Results: Of the 859 adults, 52% (n=443) were male, 80.3% (n=690) White, and 19.8% (n=170) Hispanic/Latino. Across the pooled adult population, both the male and female, White, and non-Hispanic/Latino subgroups treated with CTN 200 and 400mg demonstrated improvement in the core symptoms of ADHD per AISRS total score vs placebo ($P<0.05$) at Week 6. Improvements in symptom severity per the CGI-S were observed in the male, White, and the not Hispanic/Latino subgroups treated with CTN vs placebo ($P<0.05$). Overall, there were no significant treatment-by-subgroup interactions ($P<0.05$), indicating a similar effect across all subgroups.

Conclusions: CTN treatment demonstrated improvement in core ADHD symptoms and symptom severity vs placebo irrespective of sex, race, ethnicity in adults with ADHD.

59 - EFFECT OF CONCOMITANT TREATMENT WITH VILOXAZINE EXTENDED-RELEASE AND STIMULANTS IN ADULTS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER: CASE SERIES FROM AN OPEN-LABEL EXTENSION STUDY

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Hypothesis/Objective: Review safety and efficacy outcomes for participants with concomitant stimulant use in an open-label extension (OLE) after completing a phase 3, placebo-controlled, double-blind (DB) trial of viloxazine extended-release (ER) in adult Attention-Deficit/Hyperactivity Disorder (ADHD).

Methods: Participants completing the DB trial [NCT04016779] had the option to receive viloxazine ER in an OLE [NCT04143217]. Viloxazine was flexibly titrated between 200-600 mg/day. Adjunctive stimulant use was permitted following Week 12 at investigator's discretion. Safety and efficacy measures were assessed descriptively. The trial was planned for 3 years or until commercial availability.

Results: Few participants (n/N=10/159, 6% of safety population) were prescribed adjunctive stimulants (amphetamines n=6, methylphenidate n=4). Participants were prescribed stimulant for approximately 1/3 of their total time in the study. All participants were receiving viloxazine ER ≥ 400 mg/day at stimulant initiation. No participant experienced new onset of a treatment-related adverse event (AE) during stimulant use, and none had AEs leading to discontinuation. Four participants (40%) had transient blood pressure elevation, but none were persistent nor recorded as AEs. Small sample size and the flexible nature medication dosing prevented rigorous efficacy assessment; however, when comparing visits immediately before and after stimulant prescription, 63% showed improvement (reduction in score) in ADHD and in executive function symptoms.

Conclusions: No safety issues were noted with combined stimulant and viloxazine ER use in this small case series of adults with ADHD. Further evaluation of concomitant use in a larger adult sample is warranted.

60 - ETHNICALLY AND RACIALLY MINORITIZED COLLEGE STUDENTS' BELIEFS AND UNDERSTANDING ABOUT ADHD FOLLOWING GROUP CBT INTERVENTION: A QUALITATIVE STUDY

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City College of New York[1], Yeshiva University[2], Columbia University Medical Center[3], , Zucker School of Medicine at Hofstra/Northwell[4], Cooper Medical School of Rowan University[5]

Hypothesis/Objective: Objectives. This qualitative study investigated: (i) personal, familial and cultural beliefs surrounding ADHD, (ii) how these beliefs have impacted access to services and self-concept, and (iii) whether students' understanding and beliefs about ADHD changed after completing a group cognitive-behavioral intervention (CBT) targeting executive dysfunction.

Methods: Methods. N=26 minoritized (35% Latine; 73% BIPOC) college students [Mean (SD) age = 21.83 (2.64) years; 81% female], who met DSM-5 criteria for ADHD-I/C, completed a 12-week group CBT intervention targeting executive functioning skills. At treatment conclusion, students completed a 45-60 minute one-on-one qualitative interview. The study employed Interpretative Phenomenological Analysis to identify major themes.

Results: Results. Themes included: (i) ADHD and mental illness are often stigmatized and associated behaviors explained as characterological weaknesses or a privilege of other racial groups; (ii) difficulty talking about ADHD and mental health with parents exacerbate difficulties; (iii) individuals often inadvertently learned about ADHD as young adults via social media; (iv) younger people show greater acceptance of ADHD than older generations; (v) ADHD messaging may be more effective if delivered by respected community figures; (vi) participants expressed a desire to reassure their younger selves of their worth; (vii) participants found solace in connecting with others who have ADHD; (viii) the intervention increased ADHD acceptance and provided hope that students could learn skills to reduce impairment.

Conclusions: Conclusions and Implications. Findings highlight the loneliness, negative attributions and misinformation experienced by minoritized college students with ADHD, which group treatment may help ameliorate. Findings inform supports for students with ADHD within higher education settings.

61 - VIOLENCE EXPOSURE AND ADHD SYMPTOM SEVERITY IN YOUNG MEN & WOMEN

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Hypothesis/Objective: Although some research suggests individuals with ADHD experience heightened rates of trauma and violence exposure (VE), such as adverse childhood experiences (ACEs), minimal research has examined how violence is associated with ADHD symptom severity among young adults with ADHD. The aims of this study were to examine whether a history of VE was associated with greater ADHD symptom severity in young adults with ADHD, whether ADHD symptom severity prospectively predicted subsequent VE, and whether sex moderated these associations.

Methods: Participants (N=72) in a larger study examining the feasibility of an mHealth intervention for young adults with ADHD were between 18-21 years old (75% White, 14% Black/African American, 9.7% Asian American, 4.2% other races; 5.6% Hispanic/Latinx; 75% female, 25% male sex assigned at birth). We used baseline, follow-up , and daily ecological momentary assessment (EMA) data from participants and collateral informants to measure severity of the 18 DSM-5 ADHD symptoms (ADHD Rating Scale) and lifetime and past-month history of VE on 11 of the 25-question Stressful Life Events questionnaire. We used bedtime daily EMA questions to analyze daily reported violence exposure.

Results: Lifetime witnessed VE measured at baseline was positively associated with baseline collateral informant-report of ADHD symptom severity (total and hyperactive/impulsive scales). Collateral informant-reported baseline total ADHD symptom severity was, in turn, positively associated with subsequent month witnessed VE. Additionally, sex moderated the association between self-report baseline ADHD symptom severity (total and hyperactive/impulsive) and subsequent month witnessing.

Conclusions: Individuals with ADHD may be at a slightly higher risk for violence exposure historically and in the future, this risk may be influenced by various factors such as comorbidities, environment, and individual differences. Understanding these complexities is crucial for developing effective interventions and support strategies for individuals with ADHD who have been exposed to violence.

62 - STRENGTHENING ADHD RESEARCH THROUGH THE LENS OF LIVED EXPERIENCES

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Hypothesis/Objective: Currently, research focused on neurodiversity, specifically ADHD, has viewed ADHD through a disorder paradigm—in which the ADHD brain is understood as dysfunctional, and the focus is on identifying interventions to interrupt impairments of ADHD. However, Sonuga-Barke (2023) posits that beginning to research ADHD from a strengths-based approach may lead to better outcomes and more favorable interventions for individuals with ADHD. This new neurodiversity paradigm views the ADHD brain as atypical instead of dysfunctional. In line with research findings demonstrating the resilience experienced by many with ADHD (e.g., Dvorsky & Langberg, 2016), this neurodiversity paradigm highlights resiliency, views individuals with ADHD as having a different (rather than necessarily deficient) way of thinking, and continues to identify how interventions can help individuals with their symptoms -- but in part by promoting positive and affirmative experiences rather than solely focusing on how to quell impairing symptoms. This research highlights how ADHD traits, traditionally seen as deficits, can also be sources of creativity, innovation, and resilience. Sonuga-Burke (2024) also suggest that integrally involving individuals who are neurodivergent as a part of the research process -- not just third party or isolated advisory boards, but contributing throughout study design, implementation, and dissemination, is a key way to apply the neurodiversity paradigm. This research highlights how ADHD traits, traditionally seen as deficits, can also be sources of creativity, innovation, and resilience, illustrating how neurodiversity-informed approaches can gain traction in ADHD research settings.

Methods: As a young adult with lived experience of ADHD and a member of a participatory advisory panel for ongoing ADHD research on developing interventions for young people with ADHD, similar to the participatory research model of the RE-STAR project described by Sonuga-Barke et al. (2024), I aim to share my perspectives and those of my fellow advisory board members. Our lived experiences are crucial in shaping research that truly reflects the needs and strengths of the ADHD community. Putting the neurodiversity paradigm into practice by disseminating our participatory research, this talk will delve into our insights, emphasizing the importance of centering the voices of those with ADHD in research initiatives.

Results: The primary goal of this talk is threefold: First, to highlight the value of the neurodiversity paradigm in reframing ADHD as a different way of thinking and processing information; second, to illustrate how personal and collective experiences shared by the advisory panel regarding the strengths and challenges of living with ADHD have shaped the novel intervention being developed; third, to advocate for more inclusive research practices that actively involve individuals with ADHD in research design and implementation.

Conclusions: Looking forward, I hope that this discussion will inspire the ADHD research community to adopt more participatory and inclusive methods. By doing so, researchers can

ensure that their work is not only scientifically rigorous but also genuinely reflective of the ADHD community's diverse experiences and strengths. Embracing the neurodiversity paradigm can lead to more holistic and empowering approaches to understanding and supporting individuals with ADHD, ultimately fostering a more inclusive and supportive society.

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63 - SOCIAL PROBLEMS AND ANXIETY RISK IN SCHOOL-AGED CHILDREN WITH ELEVATED ADHD SYMPTOMS

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Hypothesis/Objective: Nearly 40% of youth with attention-deficit/hyperactivity disorder (ADHD) have anxiety (Danielson et al., 2024). Anxiety in children with ADHD predicts poorer quality of life into adulthood, beyond ADHD (Orm et al., 2023). In addition to genetic risk, psychosocial phenomena commonly experienced by children with ADHD—such as peer difficulties—may increase susceptibility to anxiety (Havewala et al., 2022, Mrug et al., 2007). While peer relationships have been linked to ADHD and anxiety in adolescents, less is known about this relation in school-age children when peer relationships become more prominent. The school-age years may represent a critical window before the transition to adolescence, which is marked by heightened sensitivity to peer feedback and peak anxiety onset (Crone & Dahl, 2012). The present study investigated social problems as a potential moderator of the association between ADHD and anxiety symptoms in 8- to 12-year-old children with ADHD symptoms. It was hypothesized that social problems would strengthen the relation between ADHD and anxiety.

Methods: Participants included parents (N = 120, Mage = 39.75, SD = 5.51) of 8- to 12-year-old children with elevated ADHD symptoms (M = 11.21 years, SD = 3.06), and a subset of their children (n = 69, Mage = 9.70 years, SD = 1.38). Parents reported that 58.30% of their children (n = 70) had previously been diagnosed with ADHD. ADHD and anxiety were measured using parent-report of the CBCL. Social problems was measured using an aggregate of parent-reported social problems and child-reported peer rejection and support. Multi-informant measures improve accuracy and better predict psychopathology (McKenna & Heaney, 2020).

Results: Moderation analysis using Process Macro revealed a significant interaction between ADHD and social problems (B = .27, SE = .11, t = 2.48, 95% CI [.05, .48], p = .015), such that the relation between ADHD and anxiety symptoms was significant at higher (B = .78, SE = .30, t = 2.64, 95% CI [.20, 1.37], p = .009) and not at lower (p = .141) levels of social problems.

Conclusions: The association between ADHD and anxiety was strengthened with greater social problems. This supports previous research showing peer support weakened the ADHD-anxiety link in adolescents, and extends this work by identifying a negative peer relationship as a moderator in school-aged children. Addressing peer relationships early in childhood could help reduce anxiety risk in youth with elevated ADHD symptoms.

64 - EARLY SKILL PROFILES IN INFANTS AT AN ELEVATED GENETIC LIKELIHOOD FOR ADHD

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Hypothesis/Objective: This study examined language, motor, and joint attention profiles in 12-month-old infants with elevated genetic likelihood for ADHD (EL-ADHD), or ASD (EL-ASD), and a low genetic likelihood for either disorder (LL) to contribute to the early detection and diagnosis of ADHD.

Methods: At 12 months of age, participants (n=105) in a study of infant development were assessed using the Mullen Scales of Early Learning (MSEL). Additionally, infants and their parents engaged in a 5-minute interaction using age-appropriate toys. In a subset of LL and EL-ADHD infants, undergraduate coders employed the Joint Engagement Rating Inventory (JERI) to rate multiple aspects of Joint Engagement (JE) and Object Engagement on a scale from 1 to 7. By December 2024, JERI ratings for the EL-ASD group will be available, enabling a comparison of JE across all three groups.

Results: In the Receptive Language domain of the MSEL, no significant group differences were observed ($F(2,76) = 2.50$, $p = .09$). However, in the Expressive Language domain, the EL-ASD group scored significantly lower than both the EL-ADHD ($p < .05$) and LL ($p < .05$) groups ($F(2,76) = 4.81$, $p < .05$), with no significant difference between EL-ADHD and LL groups.

No group differences were observed in the Fine Motor ($F(2,76) = 1.95$, $p=0.15$) or Gross Motor ($F(2,76) = 0.65$, $p=0.53$) domains of the MSEL.

EL-ADHD infants ($M=3.88$) demonstrated significantly lower quality of JE compared to LL infants ($M=4.77$, $t(24) = 2.17$, $p<.05$). Similarly, results for quantity ($t(21)=2.01$, $p=.06$) and supported ($t(24)=2.04$, $p=.05$) joint engagement suggest that EL-ADHD (quantity: $M=3.31$, supported: $M=3.88$) infants scored lower than LL infants (quantity: $M=4.31$, supported: $M=4.69$). No differences were observed between the groups in object engagement (LL: $M=3.15$, EL-ADHD: $M=3.81$, $t(24)=-1.51$, $p=.14$).

Conclusions: The study found that receptive language, fine motor, and gross motor abilities were similar across groups, while the EL-ASD group exhibited notable deficits in expressive language compared to EL-ADHD and LL groups. This suggests that expressive language deficits are specific to ASD. In terms of JE, EL-ADHD infants showed reduced quality compared to LL infants, indicating that further exploration between JE and features of ADHD is needed.

65 - NEAR AND FAR TRANSFER EFFECTS OF A BCI COGNITIVE VIDEO GAME TRAINING ON CORE ADHD SYMPTOMS AND ACADEMIC PERFORMANCE

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Hypothesis/Objective: ADHD greatly impacts academic performance. Pharmacotherapy has not demonstrated far transfer to academic performance. The BCI videogame, Skylar's Run, has demonstrated efficacy in core ADHD symptoms and a signal for improvements in math and verbal fluency.

In two pilots conducted on children in school and summer-school programs, we hypothesized that Skylar's Run would replicate previous findings demonstrating improvements in academic performance.

Methods: Twenty-seven students completed the training. Primary endpoints were the Woodcock Johnson reading and math fluency subtests and the parent-rated NICHQ Vanderbilt Assessment Scale.

Results: Students showed a mean 29.90% reduction on the Vanderbilt, with 55% exhibiting more than 25% reduction (MCID): posttest ($M = 23.45$, $SD = 10.10$), vs. baseline ($M = 35.55$, $SD = 6.88$), $t(10) = -3.47$, $p < .01$, Cohen's $d = 1.40$, 95% CI [0.41, 2.39].

Reading fluency significantly increased from pretest ($M = 35.26$, $SD = 12.86$) to posttest ($M = 44.04$, $SD = 11.01$): $t(26) = 5.77$, $p < .0001$, Cohen's $d = 0.73$, 95% CI [0.17, 1.30]. Students improved on average 1.19 years in age.

Math fluency significantly increased from pretest ($M = 50.44$, $SD = 14.83$) to posttest ($M = 55.81$, $SD = 16.15$): $t(26) = 3.50$, $p < .01$, Cohen's $d = 0.35$, 95% CI [-0.20, 0.90]. Students improved on average .51 years in age.

Conclusions: These pilots replicated findings demonstrating reductions in ADHD symptoms and far transfer to academic performance. Further research with a larger sample across a longer training period is required.

66 - DEVELOPING A DIGITAL HEALTH INTERVENTION FOR YOUNG ADULTS WITH ADHD DRIVEN BY COMMUNITY PARTNERSHIPS AND HUMAN-CENTERED DESIGN: TRAINING INHIBITORY CONTROL USING PERSONALIZED STRATEGIES (TIPS)

*Traci Kennedy[1], Aiden Williard[2], Heidi Kipp[2], Megan Davis[3], Brittany Weaver[4], Eliza Barach[5], Jayme Jenkins[6] Rebecca Miller[1], Duncan Clark[1]

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Hypothesis/Objective: Intervention development benefits from active, ongoing contributions from end users and community partners (Sonuga-Barke, 2023). Combining human-centered design (HCD) from engineering fields with community-based research is a promising avenue for developing novel ADHD interventions. We describe a community advisory board' co-development of the TIPS smartphone-based intervention for young adults with ADHD to help manage daily symptoms and alcohol use through personalized strategy suggestions.

Methods: Our community advisory board included young adults with ADHD, therapists, psychiatrists, college counselors, student disabilities coordinators, ADHD coaches, and research coordinators. With the research team, using virtual HCD methods (e.g., rose/bud/thorn, think-alouds), the advisory board co-developed the TIPS intervention across five Zoom meetings, incorporating ongoing feedback and participant data to iteratively refine intervention components.

Results: A primary theme surfaced: the need to optimize and leverage young adults' autonomy in applying intervention strategies. Therefore, we added a motivational interviewing framework to the intervention, leading to major formatting changes from declarative strategy suggestions to question-based prompts ("Some people find it helpful to X. Do you want to try this strategy?"). Additionally, we enhanced participants' choice by allowing them to swipe through and select recommendations rather than being assigned just one. Importantly, using participant acceptability data, the advisory board refined existing strategy suggestions, generated new content, and purged several suggestions.

Conclusions: By leveraging HCD and centering key partners' voices, our community advisory board crucially improved the TIPS intervention. Ongoing partnerships were developed among the research team and board members, which will enhance our future research and practice with young adults with ADHD.

67 - PERCEIVED STRENGTHS AND BENEFITS AMONG EMERGING ADULTS WITH ADHD: A MIXED METHODS, MULTI-INFORMANT STUDY

*Traci Kennedy[1]

University of Pittsburgh[1]

Hypothesis/Objective: Emerging adults with ADHD (N=72; age=18-21; 67% women, 23% men, 10% nonbinary; 75%/25% female/male sex assigned at birth; 75% White, 14% Black, 10% Asian American, 5% other races; 76% 2- or 4-year college students) and a collateral reporter (someone who knows them well and interacts with them daily; 36% parent, 44% friend or roommate, 32% partner, 12% other reporter) completed five quantitative and qualitative measures following a 3-week mobile-Health intervention within a larger study:

(1) (Quantitative) Both participants and their collateral informants completed a single-item measure: "How much do you agree with the following statement? Having ADHD has benefited me in some way, or has brought something good to my life" (1=strongly disagree to 5=strongly agree).

(2) (Quantitative) Participants completed the General Benefit Finding Scale, adapted for ADHD (e.g., "ADHD has…Helped me become a stronger person"; 0=not at all true to 4=totally true) which includes 5 subscales (Acceptance, Growth, Relationships, Empathy, and Reprioritization) and 7 additional items developed for this study (e.g., "Made me more outgoing," "Made me more creative").

(3) (Qualitative) Additionally, both participants and collateral reporters provided open-ended survey responses to the question, "What are your [this person's] three greatest strengths?" and,

(4) (Qualitative) "How has ADHD benefitted you [this person], if at all?"

(5) (Qualitative) Finally, participants completed a qualitative one-on-one interview about their experience of having ADHD. This abstract focuses on responses to the question, "Do you think there is anything good about having ADHD, or benefits you've gained from it?"

A standardized qualitative coding scheme was developed. Two independent raters coded each qualitative response; discrepancies were resolved via consensus, including with a third rater as needed. For quantitative data, descriptive statistics were calculated, t-tests were conducted to compare means by student status and sex assigned at birth, and correlations between self- and collateral-report were calculated.

Methods: Emerging adults with ADHD (N=72; age=18-21; 67% women, 23% men, 10% nonbinary; 75%/25% female/male sex assigned at birth; 75% White, 14% Black, 10% Asian American, 5% other races; 76% 2- or 4-year college students) and a collateral reporter (someone who knows them well and interacts with them daily; 36% parent, 44% friend or roommate, 32% partner, 12% other reporter) completed five quantitative and qualitative measures following a 3-week mobile-Health intervention as part of a larger study:

(1) (Quantitative) Both participants and their collateral informants completed a single-item measure: “How much do you agree with the following statement? Having ADHD has benefited me in some way, or has brought something good to my life” (1=strongly disagree to 5=strongly agree).

(2) (Quantitative) Participants completed the General Benefit Finding Scale, adapted for ADHD (e.g., “ADHD has…Helped me become a stronger person”; 0=not at all true to 4=totally true) which includes 5 subscales (Acceptance, Growth, Relationships, Empathy, and Reprioritization) and 7 additional items developed for this study (e.g., “Made me more outgoing,” “Made me more creative”).

(3) (Qualitative) Additionally, both participants and collateral reporters provided open-ended survey responses to the question, “What are your [this person’s] three greatest strengths?” and,

(4) (Qualitative) “How has ADHD benefitted you [this person], if at all?”

(5) (Qualitative) Finally, participants completed a qualitative one-on-one interview about their experience of having ADHD. This abstract focuses on responses to the question, “Do you think there is anything good about having ADHD, or benefits you've gained from it?”

A standardized qualitative coding scheme was developed. Two independent raters coded each qualitative response; discrepancies were resolved via consensus, including with a third rater as needed. For quantitative data, descriptive statistics were calculated, t-tests were conducted to compare means by student status and sex assigned at birth, and correlations between self- and collateral-report were calculated.

Results: 1) Quantitative responses showed that 59.7% of individuals with ADHD and 43.1% of collateral reporters agreed or strongly agreed that they experience benefits of ADHD. Of the 5 General Benefit-Finding Scale subscales, the mean Empathy score (2.59/4; between “moderately true” and “quite a lot true”) was highest, and higher for students (M=2.75, SD=.97) than non-students (M=2.07, SD=1.23), t=-2.352(67) p=.022. There were no other student or sex differences in benefit-finding, ts=-.964-1.019, ps=.334-.932.

2) In qualitative interviews, 69.4% of participants described benefits of ADHD, most frequently compassion/empathy (19%). For instance, ADHD “…helps me better understand where they’re coming from and…better empathize with them.” Additionally, 18% identified creativity as a benefit (“Definitely more creative. I probably wouldn’t be as good at music…without it”). Several participants (15%) described being sociable/outgoing, and 15% described openness to experiences (“I’m more willing to do exciting things ‘cause I have some of those risk-taking behaviors…”).

In open-ended survey responses, 73% of participants and 65% of collateral reporters identified benefits of ADHD. The most common benefits included self-awareness/insight (20% self-report, 9% collateral-report), productivity/efficiency (13% self, 13% collateral), compassion/empathy (12% self), and sociability (12% self).

In listing their three greatest personal strengths, compassion/empathy was the most frequent per both self-report (62%) and collateral-report (68%). Others included resilience/adaptability (46% self, 41% collateral), creativity (42% self, 4% collateral), and intelligence (3% self, 45% collateral).

3) On the item, "Having ADHD has benefited you…" participant and collateral responses were moderately correlated, $r=.497$, $p<.001$.

In listing the participant's three greatest strengths, participants and collateral informants agreed on several, especially empathy and resilience/adaptability. Participants identified some personal strengths less noted by collaterals (e.g., creativity), and vice-versa (e.g., intelligent).

In identifying open-ended benefits of ADHD, there was low-moderate inter-rater agreement about whether any benefits existed (kappa=.41, $p<.01$). Participants and collateral reporters agreed on empathy/compassion and productivity.

Conclusions: In line with trends portraying ADHD as advantageous (e.g., Archer, 2015; Holderness & Holderness, 2024), most emerging adults with ADHD identify some benefit of ADHD, though importantly, many emerging adults with ADHD and others in their lives see no benefits at all. Thus, heterogeneity exists in the experience of positive aspects of ADHD amidst its challenges. Common personal strengths and benefits of ADHD, such as empathy/compassion, periods of intense productivity, and perceived self-awareness and creativity may be helpful to leverage in strengths-based interventions. Incorporating the perspectives of young adults with ADHD and of individuals close to them crucially advances our understanding of strengths and benefits of ADHD, which can inform the development of quantitative measures of strengths and perceived benefits of ADHD.

68 - QELBREE® (VILOXAZINE EXTENDED-RELEASE CAPSULES) MEANINGFULLY IMPROVED EXECUTIVE FUNCTION IN ADULT ADHD: POST-HOC ANALYSES OF PHASE III DOUBLE-BLIND AND OPEN-LABEL EXTENSION TRIALS

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Hypothesis/Objective: Viloxazine ER (VLX-ER) significantly improved executive function (EF) measured using the Behavior Rating Inventory of Executive Function—Adult Version (BRIEF-A) self-report, in a 6-week, phase 3, double-blind trial [NCT04016779] and follow on open-label extension (OLE) trial [NCT04143217] in adult ADHD. This post-hoc analysis evaluates the percentage of participants who had EF changes sufficiently large to be clinically meaningful.

Methods: T-score changes of ≥5, ≥6, and ≥7 points were previously shown to provide 85%, 90%, 95% certainty of clinically meaningful change, respectively, on the BRIEF-A Global Executive Composite (GEC), Behavior Regulation Index (BRI), and Metacognition Index (MI). The percentage of participants meeting these reliable change indices (RCI) were measured.

Results: More VLX-ER- (56.3%-68.1%) than placebo-treated-participants (40.1%-49.0%; all $p<.05$ Somers' d), met RCI 85%, 90%, and 95% certainty thresholds for meaningful improvement for GEC and MI at double-blind end-of-study (EOS); whereas percentages meeting BRI thresholds were not significantly different. Conversely, more placebo- (6.0%-10.5%) than VLX-ER-treated-participants (2.1-6.3%) met RCI thresholds for clinically meaningful worsening for GEC and MI at double-blind EOS (again, percentages meeting BRI thresholds for worsening with VLX-ER and placebo were similar).

The percentages who met improvement thresholds during the OLE increased for participants who completed VLX-ER dose-optimization (remained in OLE ≥Week 12). For each measure (GEC, BRI, MI) the percentage meeting improvement thresholds ranged 66.7%-80.0% and percentage meeting worsening thresholds ranged 2.0%-6.0% at Week 52 (n=51).

Conclusions: VLX-ER showed high rates of clinically meaningful improvement in EF in this adult ADHD trial, that persisted or increased with continued treatment.

69 - DIFFERENCES IN CHARACTERISTICS AMONG CHILDREN, ADOLESCENTS, AND ADULTS WITH ADHD RECEIVING VILOXAZINE ER, ATOMOXETINE, OR STIMULANTS IN OPEN CLAIMS DATA

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Hypothesis/Objective: Observational studies using claims data offer insights into real-world outcomes. However, due to their non-experimental nature, they are vulnerable to selection biases and insufficient consideration of confounding factors. To better understand these challenges, we compared baseline healthcare utilization and demographic characteristics among five groups of patients with ADHD from a prescription claims database: those who filled prescriptions for 1) viloxazine ER (VLX-ER), 2) atomoxetine (ATX), 3) stimulants (STIM), 4) VLX-ER+STIM and 5) ATX+STIM.

Methods: Kythera open claims data were used for the analysis. Children (6-11 yrs), adolescents (12-17 yrs), or adults (18-65 yrs) with documented ADHD diagnosis (ICD-10: F90.x), who received an initial prescription for VLX-ER, ATX, or STIM for ≥60 days in the selection period (children/adolescents: 01Oct2021-31Aug2022; adults: 01Aug2022-30Nov2022) were included. Patient characteristics were compared across groups using non-parametric tests for continuous and categorical variables.

Results: The cohort comprised 1,046,846 patients: 20.7% children, 24.1% adolescents, and 55.2% adults. Approximately 95% of patients in each group were prescribed STIM monotherapy. Regardless of age, psychiatric complexity (number of comorbidities) was statistically significantly higher among groups using nonstimulants vs. STIM ($p<.01$) and highest for VLX-ER and VLX-ER+STIM. Likewise, patients receiving nonstimulants (with or without STIMs) were more likely to also be receiving a non-ADHD psychiatric medication at index date (most commonly SSRIs, $p<0.01$) compared with those receiving STIMs only.

Conclusions: Across all age groups, patients filling nonstimulant prescriptions were significantly more likely to have comorbid psychiatric conditions and to be prescribed non-ADHD psychiatric medications than those filling prescriptions for STIM monotherapy.

70 - WEIGHT LOSS WAS MORE COMMON THAN WEIGHT GAIN IN ADULTS TREATED WITH VILOXAZINE ER (QELBREE®) FOR ADHD IN SHORT AND LONG-TERM PHASE 3 CLINICAL TRIALS

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Hypothesis/Objective: Evaluate body weight (BW) changes with viloxazine extended release (VLX-ER) in a phase 3, double-blind, 6-week trial [NCT04016779] for adult ADHD, and its ensuing long-term, open-label extension (OLE) trial [NCT04143217].

Methods: Post-hoc analysis measuring mean and categorical (≥5%) BW changes from baseline (CFB) throughout double-blind end of study (EOS) to OLE-Week-52.

Results: At baseline, BW was 80.3±16.42kg (full analysis set, N=354; VLX-ER, n=175; placebo, n=179); 65.8% of participants had BMI ≥25 kg/m2 (overweight/obese). VLX-ER-treated participants showed significant weight loss relative to placebo by double-blind EOS (treatment difference:

-1.1±0.40 kg; P<0.0055). Additionally, more VLX-ER-treated participants lost vs. gained ≥5% BW (7.2% vs 0.0%) whereas placebo-treated participants showed opposite effects (1.1% vs. 2.2%). Similar to VLX-ER-treated participants in DB, placebo-treated participants lost weight upon switching to VLX-ER in the OLE (CFB -0.433±3.4709 kg at OLE-Week-12). Overall, weight loss appeared maintained throughout OLE treatment (CFB at OLE-Week 52 of -2.022±5.6019 kg, n=54). Participants with BMI ≥25 vs. <25 kg/m2 showed larger BW changes at both DB EOS (placebo-subtracted CFB: 1.4±0.60 kg, P<.0220 vs -0.8±0.30 kg, P=.0062) and OLE-Week-52: -2.965±6.3920 kg (n=34) vs. -0.42±3.505 (n=20).

Conclusions: Decreases in BW with VLX-ER persisted throughout treatment and were larger in adults with ADHD who were overweight/obese at baseline. Reductions in BW appear consistent with unique VXL-ER pharmacologic effects to inhibit norepinephrine transport (NET), and modulate serotonin activity, with agonistic effects at 5-HT2C, and antagonistic effects at 5-HT2B and 5-HT7, potentially facilitating weight loss by decreasing impulsive overeating.

71 - CENTANAFADINE TREATMENT RESPONSE IN A PEDIATRIC POPULATION WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

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Hypothesis/Objective: To evaluate the impact of centanafadine (CTN)—a norepinephrine, dopamine, serotonin reuptake inhibitor—on treatment response rates in a pediatric ADHD population.

Methods: Two phase 3 trials (NCT05428033 & NCT05257265) evaluated the efficacy and safety of once-daily extended-release CTN for ADHD treatment (aged 6-12y and 13-17y, respectively). Patients were randomized to high-dose CTN, low-dose CTN, or placebo for 6 weeks; dosing in children (6-12y) was weight-based. Responder rates were ≥30%, ≥40%, or ≥50% change in ADHD-RS-5 and 1- or 2-point change in Clinical Global Impression of Change (CGI-C) analyzed via a Cochran-Mantel-Haenszel test. P-values were not controlled for multiplicity for these exploratory analyses and are therefore descriptive.

Results: Of randomized patients, 367/480 (76%) children (mean age 9.2y) and 371/459 (81%) adolescents (mean age 14.7y) completed their respective studies. Up to Week 6, the percentage of children with a ≥30% response (ADHD-RS-5) was 44.8% for high-dose CTN vs 32.5% for placebo (P=0.0250) and for adolescents, 69.1% for high-dose CTN vs 50.3% for placebo (P=0.0013). Rates of ≥40% and ≥50% ADHD-RS-5 response were higher for high-dose CTN versus placebo for both children and adolescents. The percentage of children with a CGI-C score of 1 or 2 was 36.4% for high-dose CTN vs 22.5% for placebo (P=0.0128) and for adolescents was 50.3% for high-dose CTN vs 34.5% for placebo (P=0.0075).

Conclusions: Pediatric patients treated with high-dose CTN showed higher response rates when compared to placebo in the change from baseline for ADHD-RS-5 and CGI-C.

72 - EFFICACY OF CENTANAFADINE ON CONNERS 3 CONTENT SCALES IN CHILDREN WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

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Hypothesis/Objective: The aim of this work was to evaluate the impact of centanafadine (CTN), a norepinephrine, dopamine, serotonin reuptake inhibitor, on hyperactivity/impulsivity (H/I), inattention, and executive functioning (EF) via caregiver proxy in children with ADHD.

Methods: This phase 3, double-blind, randomized, placebo-controlled trial (NCT05428033) evaluated the efficacy and safety of once-daily extended-release CTN for ADHD treatment in children (aged 6–12y). Patients were randomized (1:1:1) to weight-based high-dose CTN, low-dose CTN, or placebo for 6 weeks. Secondary efficacy outcomes included the Conners 3-Parent Short (PS; caregiver perspective) H/I, inattention, and EF content scale T-scores at Week 6, analyzed using a mixed-effect model for repeated measures. Values are LS mean change from baseline (standard error). P-values were not controlled for multiplicity and are descriptive.

Results: Overall, 457 children were randomized and treated. Significant improvements in H/I were observed for high-dose CTN vs placebo on the Conners 3-PS at Week 6 (−11.5 [1.1] vs −6.9 [1.1], P=0.0022). Similarly, significant improvements were also seen in other content scales at Week 6 (inattention: −11.9 [1.1] vs −6.4 [1.1], P=0.0002; EF: -11.3 [1.1] vs -6.8 [1.1], P=0.0026).

Conclusions: High-dose CTN showed an early and sustained impact on improving core H/I, inattention, and executive functioning symptoms of ADHD in children when compared to placebo, with greater caregiver perceptions of symptom improvement.

73 - TREATMENT OF ADHD IN GIRLS: POST-HOC ANALYSIS OF VILOXAZINE ER SAFETY AND EFFICACY DATA STRATIFIED BY SEX

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Hypothesis/Objective: Despite increasing attention to the treatment of ADHD in girls and women, potential for sex-specific responses to ADHD medications have not been well-studied. This post-hoc analysis of pediatric trials evaluated sex-specific (girls vs. boys) safety and efficacy of viloxazine ER, an FDA-approved treatment for pediatric and adult ADHD.

Methods: We conducted a post-hoc analysis, stratified by sex, of four pooled, phase 3, double-blind, placebo-controlled (DBPC) pediatric trials (NCT03247530, NCT03247517, NCT03247543, NCT03247556, n=1604, 35% female, 100-600mg fixed dose) and an ensuing open label extension (OLE) trial that also included phase 2 participants (NCT02736656, n=1100, 34% female, flexible dose, ≤400mg/day for children and ≤600mg/day for adolescents).

Results: In the pooled DBPC trials, girls and boys treated with viloxazine ER had similar baseline ADHD-RS-5 (42.1±7.50 and 42.8±7.43 (mean ± SD), respectively), Inattention subscale (22.3±3.54 and 22.6±3.52), and Hyperactivity/Impulsivity subscale scores (19.7± 5.42 and 20.2±5.60); and similar changes with treatment at week 6. ADHD-RS-5 improvement in girls and boys was (LS mean ± SE) 17.2±0.77 and -17.0±0.56, respectively. Girls and boys also showed similar improvement in the OLE through 36 months. Types of AEs were also similar during DB treatment; somnolence (15.1% girls; 14.2% boys) and headache (9.4%, 11.5%) were most commonly reported.

Conclusions: Using standard clinical trial assessments, efficacy and safety of viloxazine ER appeared generally similar in girls and boys in this analysis of viloxazine ER clinical trials. To build on current data, clinical assessments evaluating sex-specific aspects of ADHD (e.g., relationship to menstrual cycle) may be informative for future trials.

74 - RETROSPECTIVE STUDY OF PSYCHIATRIC MEDICATION BURDEN IN ADULTS WITH ADHD RECEIVING A THERAPEUTIC REGIMEN INCLUDING PSYCHOSTIMULANTS AND VILOXAZINE EXTENDED-RELEASE CAPSULES

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Hypothesis/Objective: Viloxazine extended-release (VLX-ER) is a nonstimulant FDA-approved medication for pediatric and adult ADHD treatment. Patients with ADHD often have psychiatric comorbidities, and may sometimes also have complex psychiatric drug regimens. We investigated the safety, efficacy, and impact on psychiatric medication burden when incorporating VLX-ER into ADHD treatment regimens.

Methods: This was a retrospective study of adults with ADHD from a group psychiatric practice who were receiving ≥1 psychostimulant for ≥3 months prior to starting treatment with VLX-ER. Patients who filled ≥2 prescriptions for VLX-ER were included (n=70; 41.4% female, 55.7% male, 2.9% nonbinary; 37 ± 13.9 years (mean age ± SD)). Paired-sample t-tests measured changes in medication burden, efficacy measures, and adverse experience survey responses at baseline and endpoint (2-3 visits after VLX-ER initiation).

Results: Stimulant dosage decreased by (mean ± SD) 26 ± 30mg (calculated relative to 1mg base amphetamine) from baseline 37 ± 26.6mg ($p<0.025$; n=29). Statistically significant decreases ($p<0.025$) were also observed in immediate-release stimulant booster presence, number of other psychiatric medications, and number of controlled substances; changes in sleep medications and benzodiazepines were nonsignificant. ADHD symptoms, measured using the ASSET severity score, improved -0.68 ± 0.87 from baseline 3.81 ± 0.97 ($p<0.025$; n=44). No surveyed adverse event showed statistically significant worsening, with fatigue and anger showing significant improvement relative to baseline ($p<0.025$).

Conclusions: Although preliminary, this retrospective study suggests that for adults with ADHD, treatment with viloxazine ER might allow for reduction in stimulants and/or psychiatric medications without apparent loss of ADHD treatment efficacy or tolerability.

75 - BEYOND DEFICITS: INSIGHTS FROM CURRENT RESEARCH ON ADHD STRENGTHS AND THEIR SIGNIFICANCE

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Hypothesis/Objective: Research on attention deficit hyperactivity disorder (ADHD) has traditionally focused on deficits within a disorder paradigm. However, interventions targeting deficient ADHD-related brain processes have shown limited success (e.g., Westwood et al.,

2023). Many adults with ADHD prefer strengths-focused approaches like ADHD coaching over traditional mental health services (Schrevel et al., 2016), indicating a treatment gap. Recent qualitative research suggests individuals with ADHD may view core aspects of their condition as both challenges and strengths (Nordby et al., 2023), and that the DSM 5 criteria inadequately capture the ADHD experience (Ginapp et al., 2023).

Alternative approaches often embrace the neurodiversity framework (see Sonuga-Barke, 2023) reframing ADHD as a neurological variation rather than a deficit. These approaches aim to identify and leverage individual strengths, which has been linked to increased well-being (Ghielen et al., 2017) and increased resilience (Charabin et al., 2023). While acknowledging well-established ADHD-related challenges, this perspective also recognizes potential advantages that, when nurtured, can lead to exceptional outcomes. Despite theoretical and practical reasons for understanding ADHD-related strengths, research in this area remains limited, relying heavily on qualitative methodology and self-reports, with minimal quantitative and behavioral studies.

Therefore, this presentation aims to summarize documented ADHD-related strengths and then identify the strengths most consistently supported by the evidence to date. In so doing, it seeks to lay the groundwork for future ADHD strengths research, including more quantitative and behavioral work, and to encourage the development of strengths-based interventions. Together this addresses the limitations of current ADHD treatment approaches highlighted in recent literature (e.g., Schrevel et al., 2016; Westwood et al., 2023).

Methods: We conducted a comprehensive review of publications using the keywords "strengths", "ADHD," “neurodiversity”, “creativity”, “resilience”, “hyperfocus” and further identified articles from reference lists. Publications included both adult and child participants in their sample. Methodological designs ranged from qualitative thematic analyses, quantitative self-reports and behavioral studies. In total, we identified 54 articles that form the basis of this literature review.

Results: Challenging the traditional deficit-focused paradigm of ADHD, a diverse array of ADHD-related strengths was revealed. The most consistently reported strengths across studies included creativity/cognitive flexibility, hyperfocus, and entrepreneurial tendencies.

Creativity and cognitive flexibility emerged as robust ADHD-related strengths, documented by a wide range of methodologies including qualitative, quantitative behavioral, and self-report studies (For a review see Hoogman et al., 2020; Schippers et al., 2024). This finding suggests that individuals with ADHD may be especially likely to possess creative abilities that could be harnessed in various personal and professional contexts.

Hyperfocus, the ability to concentrate intensely on tasks of interest, was another frequently reported strength (Dwyer et al., 2024; Garcia Pimenta et al., 2024; Groen et al., 2020; Hupfeld et al., 2019; Ozel-Kizil et al., 2016; Schippers et al., 2024; Sedgwick et al., 2019). While primarily supported by qualitative and self-report studies, the consistency of this finding across multiple investigations suggests its potential significance in the ADHD experience and contradicts the pervasive myth that individuals with ADHD “cannot focus”. It further illuminates ADHD as a challenge in regulation rather than a deficit of attention or knowledge.

Entrepreneurial tendencies were also prominently featured in the literature. This strength, supported by qualitative and self-report studies, indicates that individuals with ADHD may possess characteristics conducive to entrepreneurial success, such as risk-taking. Nevertheless, more work is needed to truly understand the relationship between ADHD symptomology and entrepreneurial pursuit.

Other reported strengths included high energy/drive (Sedgwick et al., 2019), enhanced sensory processing sensitivity (Schippers et al., 2024), empathy/altruism (Sedgwick et al., 2019), bravery/risk-taking/spontaneity (Nordby et al., 2023; Sedgwick et al., 2019; Wismans et al., 2020), and resilience (Charabin et al., 2023; Nordby et al., 2023; Sedgwick et al., 2019).

Conclusions: Our findings emphasize the importance of understanding and leveraging ADHD-related strengths, particularly creativity, hyperfocus, and entrepreneurial tendencies, which emerged as the most consistently reported strengths across various studies.

The support for creativity across qualitative, quantitative behavioral, and self-report studies provides a strong foundation for future research and intervention development. Similarly, the consistent reporting of hyperfocus and entrepreneurship, albeit primarily through qualitative and self-report methods, underscores the need for more rigorous quantitative and behavioral investigations in these areas.

These findings have significant implications for both scientific knowledge and clinical practice. First, they call for a more nuanced understanding of ADHD that acknowledges the potential advantages that may coexist alongside challenges. This perspective aligns with recent research suggesting that individuals with ADHD may view core aspects of their condition as both challenges and strengths (Nordby et al., 2023), and that current diagnostic criteria may not fully capture the ADHD experience (Ginapp et al., 2023).

Second, findings support the integration of strength-based approaches in ADHD treatment. Practitioners should consider identifying and leveraging clients' unique strengths and optimal environments, moving beyond the traditional focus on deficit remediation. This approach not only addresses the limitations of current ADHD treatments, but also aligns with the preferences of many adults with ADHD for strengths-focused interventions (Schrevel et al., 2016).

In summary, key take-away messages are as follows:

1. More quantitative and behavioral studies are needed to further validate and understand ADHD-related strengths, particularly creativity, hyperfocus and entrepreneurship.

2. Clinical practice should incorporate strength-based approaches, including strength identification and environmental optimization.

3. Psychoeducation that emphasizes both the challenges and potential strengths associated with ADHD is crucial, framing it as a difference in neurological wiring rather than solely as a deficit.

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