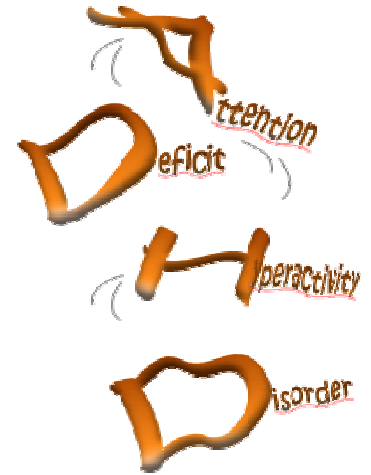
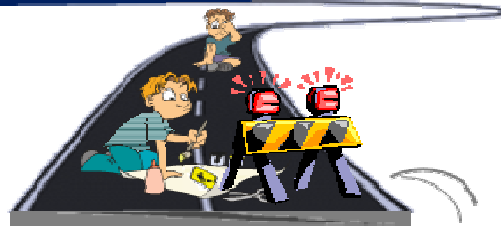


NEWSLETTER



INDICE:

1. Dalle banche dati bibliografiche pag. 2
2. Documenti
 - **“Individuazione precoce del disturbo da deficit di attenzione/iperattività (DDAI-ADHD) nella scuola dell’infanzia”.**
GRIIS – Integrazione Inclusione Scolastica. Gruppo di ricerca e Inclusione Scolastica – Facoltà di Scienze della Formazione, Università di Bolzano. pag. 50
3. Congressi, Corsi, ...
 - **4° Workshop sull’ADHD - SINPIA Sezione Regionale Sardegna e Clinica di Neuropsichiatria Infantile dell’Università degli Studi di Cagliari Dipartimento di Neuroscienze, 8-10 marzo 2012, Cagliari** pag. 51

BIBLIOGRAFIA ADHD NOVEMBRE 2011

Acad Pediatr. 2011;11:500-07.

THE PATIENT-CENTERED MEDICAL HOME, PRACTICE PATTERNS, AND FUNCTIONAL OUTCOMES FOR CHILDREN WITH ATTENTION DEFICIT/HYPERACTIVITY DISORDER.

Toomey SL, Chan E, Ratner JA, et al.

Objective: To determine whether children with attention deficit/hyperactivity disorder (ADHD) receive care in a patient-centered medical home (PCMH) and how that relates to their ADHD treatment and functional outcomes.

Methods: Cross-sectional analysis of the 2007 National Survey for Children's Health, a nationally representative survey of 91,642 parents. This analysis covers 5169 children with parent-reported ADHD ages 6-17. The independent variable is receiving care in a PCMH. Main outcome measures are receiving ADHD medication, mental health specialist involvement, and functional outcomes (difficulties with participation in activities, attending school, making friends; having problem behaviors; missed school days; and number of times parents contacted by school).

Results: Only 44% of children with ADHD received care in a PCMH. Children with ADHD receiving care in a PCMH compared with those who did not were more likely to receive medication for ADHD (odds ratio [OR], 1.4; 95% confidence interval [CI], 1.1-1.9); less likely to have mental health specialist involvement (OR, 0.6; 95% CI, 0.4-0.7); less likely to have difficulties participating in activities (OR, 0.6; 95% CI 0.4-0.8), making friends (OR, 0.6; 95% CI, 0.5-0.9), and attending school (OR, 0.4; 95% CI, 0.3-0.6); less likely to have problem behaviors (OR 0.6; 95% CI 0.5-0.9); had fewer missed school days ((beta) = -1.5, 95% CI -2.4 to -0.5); and parents were contacted by school less frequently ((beta) = -0.2, 95% CI -0.3 to -0.1).

Conclusions: For children with ADHD, receiving care in a PCMH is associated with practice pattern change and better outcomes. The PCMH may represent a promising opportunity to improve quality of care and outcomes for children with ADHD.

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Per la ricerca degli articoli pubblicati nella letteratura scientifica nel mese in esame sono state consultate le banche dati Medline, Embase, PsycINFO e PsycArticle utilizzando le seguenti parole chiave (o i loro sinonimi): 'Attention deficit disorder', 'Attention deficit hyperactivity disorder', 'infant', 'Child', 'Adolescent', 'Human'. Sono qui riportate le referenze considerate rilevanti e pertinenti.

Acta Paediatr Int J Paediatr. 2011;100:e267-e274.

CENTRAL NERVOUS SYSTEM PROCESSING OF EMOTIONS IN CHILDREN WITH FAECAL INCONTINENCE.

Becker A, Rubly M, El Khatib D, et al.

Aim: Faecal incontinence (FI) is a common disorder involving both the enteric (ENS) and central nervous systems (CNS). The aim of the study is to analyze neurophysiologically the central processing of emotions in children with FI, healthy controls and children with Attention-deficit hyperactivity disorder (ADHD).

Methods: Fourteen children with FI and constipation, nine with non-retentive FI, 15 controls and 13 children with ADHD were examined. The methods included a physical exam, sonography, Child Behavior Checklist, a psychiatric interview and intelligence test. Acoustic evoked potentials were recorded according to standardized methodology. For the event-related potentials, 80 neutral, 40 positive and 40 negative pictures from the International Affective Picture System (IAPS), and 40 pictures depicting faeces were presented.

Results: Children with FI had significantly more intense responses for most stimuli over the frontal, central and parietal regions compared to controls. Stool pictures did not evoke stronger responses than other stimuli. Children with constipation elicited stronger responses. Children with ADHD did not differ from controls. Acoustic evoked potentials were comparable in all groups.

Conclusions: Children with FI have increased responses in the processing of emotions. These can be interpreted as a neurobiological vulnerability, possibly due to the association of the ENS and CNS.

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Acta Psychiatr Scand. 2011.

PREDICTORS OF PERSISTENCE IN GIRLS WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER: RESULTS FROM AN 11-YEAR CONTROLLED FOLLOW-UP STUDY.

Biederman J, Petty CR, O'Connor KB, et al.

Objective: This study sought to examine the age-dependent persistence of attention deficit hyperactivity disorder (ADHD) and its predictors in a large sample of girls with and without ADHD followed prospectively for 11 years into young adulthood.

Method: Participants were girls with (N=96) and without (N=91) ADHD and were 6-17 years old at the baseline assessment (mean age, 11 years) and 15-30 years old at the follow-up assessment (mean: 22 years). Participants were comprehensively and blindly assessed with structured diagnostic interviews and assessments of cognitive, social, school, and family functioning.

Results: At the 11-year follow-up, 33.3% met full criteria for ADHD, 29.2% showed partial persistence of the disorder, 10.4% had impaired functioning, and 4.2% were remitted but treated (77.1% of the sample). Predictors of persistence were psychiatric comorbidity, family history of psychopathology, and family and school functioning at baseline.

Conclusion: These long-term, prospective, follow-up findings extend to girls findings that ADHD is persistent over the long term and can be predicted from psychosocial adversity and psychiatric comorbidity ascertained 11 years earlier.

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ADHD Atten Deficit Hyperact Disord. 2011;3:335-49.

PSYCHOMETRIC PROPERTIES OF THE QUALITY OF LIFE SCALE CHILD HEALTH AND ILLNESS PROFILE-CHILD EDITION IN A COMBINED ANALYSIS OF FIVE ATOMOXETINE TRIALS.

Schacht A, Escobar R, Wagner T, et al.

Our aim was to evaluate the psychometric properties of the generic quality of life (QoL) scale Child Health and Illness Profile-Child Edition (CHIP-CE) by means of a combined analysis of atomoxetine clinical trials in children and adolescents with attention-deficit/hyperactivity disorder (ADHD). Individual patient-level data from five clinical trials were included in the combined analysis. Psychometric properties of the CHIP-CE were explored in terms of internal consistency and structure. Patients (n = 794) aged between 6 and 15 years (mean 9.7) with mean baseline ADHD Rating Scale of 41.8 (plus or minus) 8.04 were included. On average, 0.7 (SD 2.23) items were missing for the whole CHIP-CE. The internal consistency of the CHIP-CE assessed by Cronbach's alpha was good for all sub-domains at baseline and at endpoint. Considerable

ceiling effects were only observed for the "restricted activity" sub-domain. No considerable floor effects were seen. The factor analysis supported the 12-factor solution for the sub-domains, but not the 5-factor solution for the domains. Our analyses were based on a large sample of non-US patients which allowed the measurement of clear changes in QoL over time. The results support that the CHIP-CE scale is psychometrically robust over time in terms of internal consistency and structure.

ADHD Atten Deficit Hyperact Disord. 2011;3:301-18.

AN EXPLORATION OF THE ASSOCIATIONS OF PREGNANCY AND PERINATAL FEATURES WITH CYTOKINES AND TRYPTOPHAN/KYNURENINE METABOLISM IN CHILDREN WITH ATTENTION-DEFICIT HYPERACTIVITY DISORDER (ADHD).

Oades RD.

Intra-individual variability of the characteristics of children with attention-deficit hyperactivity (ADHD) may reflect compromised glial energy supply in the synapse. We reported recently that while serum levels of a glial marker, the cytokine S100B, were not seriously altered, levels of other cytokines and tryptophan metabolites were related to symptoms, attention and variability. Here, we explore with a regression analysis whether levels of these substances were associated with features of the index pregnancy of potential aetiological significance. Serum was taken from 35 children with DSM-IV ADHD (14 on medication) and 21 typically developing controls to measure 8 cytokines (S100B, IL-2, IL-6, IL-10, IL-13, IL-16, TNF-(alpha) and IFN-(gamma)) and 5 metabolites (Tryptophan, Kynurenine, Kynurenate [KA], 3-hydroxy-kynurenine [3HK] and 5-hydroxyindole acetic acid [5-HIAA]). The mothers received a 124-item questionnaire on features surrounding the pregnancy. (1) For children with ADHD, a shorter pregnancy and smaller birth weight were associated statistically with increased 3HK and IFN-(gamma) and for obstetric problems with decreased TNF-(alpha) levels. (2) Maternal smoking related to decreasing kynurenine and increasing 3HK and S100B levels in ADHD children. Paternal smoking was associated with increased tryptophan in the controls and increased IL-6 levels in ADHD children. (3) The taking of supplements often related to decreasing TNF-(alpha), increasing IL-10 and lower 5-HIAA levels in the ADHD children. Less 5-HIAA but more tryptophan was associated with earlier and later life events, respectively. (4) Increased IL-16 and 5-HIAA levels in the ADHD group related to reports of poorer infant health. Unexpectedly, more child care (seafood and time together) in ADHD than healthy families was implicated by lower tryptophan levels and an altered balance of pro-inflammatory cytokines. Across measures control families generally showed either non-significant associations or the opposite to those of the ADHD group. In ADHD children more than controls, the balance of potentially toxic or protective kynurenine metabolites and of pro- over anti-inflammatory cytokines may reflect the perinatal experience associated with stress, but not with maternal illness.

Am J Med Genet Part B Neuropsychiatr Genet. 2011;156:888-97.

GENOME-WIDE ASSOCIATION STUDY IN GERMAN PATIENTS WITH ATTENTION DEFICIT/HYPERACTIVITY DISORDER.

Hinney A, Scherag A, Jarick I, et al.

The heritability of attention deficit hyperactivity disorder (ADHD) is approximately 0.8. Despite several larger scale attempts, genome-wide association studies (GWAS) have not led to the identification of significant results. We performed a GWAS based on 495 German young patients with ADHD (according to DSM-IV criteria; Human660W-Quadv1; Illumina, San Diego, CA) and on 1,300 population-based adult controls (HumanHap550v3; Illumina). Some genes neighboring the single nucleotide polymorphisms (SNPs) with the lowest P-values (best P-value: 8.38×10^{-7}) have potential relevance for ADHD (e.g., glutamate receptor, metabotropic 5 gene, GRM5). After quality control, the 30 independent SNPs with the lowest P-values (P-values (less than or equal to) 7.57×10^{-5}) were chosen for confirmation. Genotyping of these SNPs in up to 320 independent German families comprising at least one child with ADHD revealed directionally consistent effect-size point estimates for 19 (10 not consistent) of the SNPs. In silico analyses of the 30 SNPs in the largest meta-analysis so far (2,064 trios, 896 cases, and 2,455 controls) revealed directionally consistent effect-size point estimates for 16 SNPs (11 not consistent). None of the combined

analyses revealed a genome-wide significant result. SNPs in previously described autosomal candidate genes did not show significantly lower P-values compared to SNPs within random sets of genes of the same size. We did not find genome-wide significant results in a GWAS of German children with ADHD compared to controls. The second best SNP is located in an intron of GRM5, a gene located within a recently described region with an infrequent copy number variation in patients with ADHD.

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An Pediatr. 2011.

EARLY DIAGNOSIS OF ATTENTION DEFICIT DISORDER WITH/WITHOUT HYPERACTIVITY USING THE SCREENING PROCEDURE OF THE AMERICAN ACADEMY OF PEDIATRICS FOR PRIMARY CARE IN 8 YEAR-OLD COHORTS.

Fernandez Perez M, Gonzalvo Rodriguez C.

Introduction: Attention Deficit/Hyperactivity Disorder (ADHD) is the main problem of child mental health in our field. However we do not have systematised procedures that may lead to a diagnosis in early ages to improve the long-term prognosis. In order to improve early diagnosis we propose a strategy for Primary Care.

Objective: To determine the feasibility and effectiveness of incorporating screening for ADHD in cohorts of 8 years in a Primary Care Paediatric Clinic in a town in Asturias (Spain) for 4 consecutive years.

Subjects and methods: A cross-sectional study of prevalence was conducted using the questionnaire recommended by the American Academy of Paediatrics. This consisted of 7 questions, to which was added a new item, vs. inattention. The questionnaire was administered by a nurse to all children aged 8 at the time they attended the review, and for 4 consecutive years.

Results: A total of 222 children were evaluated, finding 18 positive cases, who scored low in the questionnaire. These cases were evaluated by the paediatrician in a second assessment, who confirmed ADHD in 12 cases. The validity of the test, estimated sensitivity and specificity of the test was high (100% sensitivity and a specificity of 99.5%).

Conclusions: The study was valid for the early detection of ADHD in a Primary Care Paediatric Clinic to diagnose a large number of latent cases. The procedure was cost-effective and reinforces the role of nursing in this care process.

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Ann Neurol. 2011;70:S140-S141.

ATTENTION DEFICIT HYPERACTIVITY DISORDER IN EPILEPTIC CHILDREN WITH DEVELOPMENTAL DELAY.

Kim GH, Eun SH, Byeon JH.

Objective: It is known that the attention deficit hyperactivity disorder (ADHD) is more frequent in children with epilepsy than in the general pediatric population. The aim of this preliminary study was to investigate whether the prevalence of ADHD in epileptic children is higher even for people with well controlled epilepsy and without a significant developmental delay.

Methods: Epileptic children, aged 6 to 12 years, who visited for 6 consecutive months were included in the study. Among them we included only those without significant developmental delay as well as being seizure -free for over 3 months. We utilized parent questionnaires based on DSMIV criteria to diagnose ADHD and Korean version of Child Behavior Checklist and Child Depression Inventory.

Results: We enrolled 56 patients (mean age, 9.662.3) including 27 boys and 29 girls. Twelve (21.4%) were diagnosed with ADHD (9 combined, 3 inattentive types; 6 boys, 6 girls). The number of ADHD patients vary by epilepsy types: childhood or juvenile absence epilepsy (42.8%, 3 of 7); cryptogenic focal epilepsy (20.8%, 5 of 24); generalized epilepsy (20.0%, 2 of 10); benign rolandic epilepsy (13.3%, 2 of 15).

Conclusions: The results indicate that the prevalence of ADHD can be higher even for children with well controlled epilepsy and without significant developmental delay. And the most predominant type of ADHD is the combined type, which is the same as in the general pediatric population.

Ann Neurol. 2011;70:S143.

CLONIDINE EXTENDED RELEASE TABLETS FOR THE TREATMENT OF ADHD IN CHILDREN AND ADOLESCENTS WITH INADEQUATE RESPONSE TO STIMULANTS.

Cutler AJ, Tenorio E, Wang C, et al.

Objective: This double-blind, flexible-dose study assessed the efficacy and safety of clonidine hydrochloride extended-release tablets (CLON-XR) combined with stimulants in pediatric and adolescent patients with attention-deficit/hyperactivity disorder (ADHD).

Methods: Patients aged 6 to 17 years with hyperactive or inattentive/hyperactive ADHD who had inadequate response after (greater-than or equal to) 30 days on a stable stimulant regimen received CLON-XR (total dose of 0.1-0.4 mg/d; >0.1 mg/d, twice daily) or placebo combined with their stimulant regimen. The primary endpoint was mean change in ADHD Rating Scale-IV (ADHD-RS-IV) total score from baseline to week 5. Safety data were collected throughout the study.

Results: At week 5, patients who received CLON-XR plus stimulants (n=102) had significant improvement in ADHD-RS-IV total score (P=0.009) and in inattention (P=0.017) and hyperactivity/impulsivity (P=0.014) subscale scores. Rates of treatment-emergent adverse events (TEAEs) were similar between treatment groups (45% and 41% for CLON-XR plus stimulants and placebo plus stimulants, respectively). Somnolence and fatigue were two of the most common TEAEs. Small changes in cardiovascular parameters occurred in the CLON-XR plus stimulants group, but these changes were not clinically significant and did not necessitate discontinuation of treatment. Alterations in electrocardiographic measurements were minimal and did not warrant discontinuation in any patient. Sinus bradycardia occurred in 11% and 2% of patients in the CLON-XR plus stimulants and placebo plus stimulants groups, respectively.

Conclusions: These results suggest that flexible-dose CLON-XR 0.1 to 0.4 mg/d is an effective and safe adjunctive therapy to stimulants for pediatric and adolescent patients with ADHD and an inadequate response to stimulants.

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Ann Neurol. 2011;70:S29.

ATTENTION DEFICIT HYPERACTIVITY DISORDER IN DEPRESSED ADULTS.

Rodriguez Leyva I, Silva RH, Renteria Palomo AA.

Objective: Attention deficit hyperactivity disorder (ADHD) is now recognized as a common disorder, as well as in children and adults. ADHD has an estimated prevalence of 3-5% in adults. Evidence points to an increased rate of a co-morbidity in adult ADHD patients. The most common are disorders of the affective area, including depression. We investigated the comorbidity between these two conditions.

Methods: Two questionnaires were applied, the first is the Hamilton Depression Scale D and the second is the Adult Self-Assessment Scale (EAVA), developed by the working group on adult ADHD, which includes the New York University Medical Center, Harvard Medical School and Massachusetts General Hospital.

Results: 50 patients, 42 women and 8 men. 74% had some level of depression. 18% had criteria for ADHD (12% inattentive, 6% impulsive). By correlating the scale of Hamilton with the score of EAVA, results that in patients with ADHD and depression, impulsive symptom severity decreased in proportion to the degree of depression.

Conclusions: In patients with ADHD and depression, the intensity of the symptoms of inattention and not those of impulsiveness, are related in proportion to the degree of comorbid depression measured by the Hamilton Scale.

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Ann Neurol. 2011;70:S142.

EXECUTIVE FUNCTION IMPAIRMENT IN CHILDREN WITH ADHD IN BOGOTA, COLOMBIA.

Velez-van-Meerbeke A, Talero-Gutierrez C, Guzman G, et al.

Objective: To determine the association of executive function impairment in children from a school sample in Bogota, Colombia with Attention deficit and hyperactivity disorder.

Methods: Sample cases (n=117) were selected from children with positive symptoms of ADHD (DSM IV) of public and private schools from low and medium socioeconomic level. Diagnosis of ADHD was confirmed by the Behavior Assessment System for Children scale. All cases were evaluated by the WISC-R test in order to exclude those with cognitive deficits. Control group (n=85) was composed by children from the same school level but without symptoms of ADHD. Afterwards, they were assessed on six executive functions (EF) measures. Statistical analysis was conducted to realize comparisons between variables, a multivariate study (MANCOVA) and a logistic regression analysis.

Results: 117 ADHD and 85 controls children with age between 6 and 12 years were studied. When controlled by gender, age and type of school, children with ADHD were significantly more impaired in measures of EF than controls ($p < 0,001$, MANCOVA). Graphic fluidity and Rey-Osterrieth Complex Figure appeared to be the most compromise subtests. When ADHD groups were compared, results were similar in the attention deficit and combined deficit children; in hyperactive-impulsive cases we found only impairment in verbal fluidity.

Conclusion: Children with ADHD displayed more problems on EF measures especially in fluidity and planning. There appears to be heterogeneity in EF impairment between gender and age.

Ann Neurol. 2011;70:S147-S148.

SINGLE DOSE PHARMACOKINETICS OF NWP06, A NOVEL EXTENDED RELEASE METHYLPHENIDATE ORAL SUSPENSION FOR THE TREATMENT OF ADHD.

Berry S, Belden H, Childress A.

Objective: CDC prevalence data suggest 1 in 10 US children are diagnosed with ADHD, making ADHD the most common childhood neurobehavioral disorder. An unmet need exists for an extended-release (ER) liquid formulation of methylphenidate (MPH) for children with difficulty swallowing tablets or capsules. This study compares single-dose pharmacokinetics of NWP06, a novel liquid ER formulation of MPH to immediate-release (IR) liquid MPH and examines any effects of food.

Methods: 30 healthy adult subjects enrolled in this openlabel, randomized, three-treatment crossover study. Subjects received NWP06 under fasting and fed conditions and IR MPH oral solution under fasting conditions (7-day washout). Blood samples were collected prior to dose and periodically up to 36 hours post-dose.

Results: Ratios for extent of exposure (AUC) following administration of NWP06 and IR MPH met standard bioequivalence acceptance criteria. The ratio for rate of exposure was outside standard bioequivalence limits, with IR MPH having a 45% higher C_{max}. (Table presented) Food increased bioavailability of NWP06. The rate and extent of exposure were ~25% higher after a high fat meal. Vital sign changes were as expected for MPH. No clinically significant laboratory or ECG changes were reported. Most common AEs reported were headache, dizziness, palpitations, and nervousness.

Conclusions: NWP06 is bioequivalent to IR MPH in extent of exposure (AUC), but NWP06 has a lower C_{max} than IR MPH. NWP06 has a modest food effect. Both treatments were well tolerated.

Ann Neurol. 2011;70:S143.

SAFETY AND EFFICACY OF CHRONIC ADMINISTRATION OF CLONIDINE EXTENDED RELEASE TABLET MONOTHERAPY OR COMBINATION THERAPY IN PEDIATRIC PATIENTS WITH ADHD.

Giblin JM, Tenorio E, Wang C, et al.

Objective: To evaluate the safety and efficacy of clonidine extended-release tablets (CLON-XR) alone or in combination with other medications for the treatment of attentiondeficit/ hyperactivity disorder (ADHD) in pediatric patients for up to 1 year.

Methods: Patients aged 6 to 17 years with ADHD who previously completed a phase 3 efficacy trial of CLON-XR alone or in combination with other ADHD medications or who discontinued for reasons other than safety were enrolled. Patients received flexible dosing of CLON-XR (0.1-0.4 mg/d; twice daily for doses >0.1 mg/d) alone or with other ADHD medications.

Results: The safety population comprised 301 patients; 33% received CLON-XR monotherapy, and 67% received CLON-XR in combination with other therapies. Treatment-emergent adverse events (TEAEs) were reported in 84% and 81% of patients in the CLON-XR alone and CLON-XR combination groups, respectively. The most common TEAEs (incidence (greater-than or equal to)10%) were somnolence (32%), headache (16%), URI (13%), upper abdominal pain (12%), and fatigue (12%). Seventeen patients (6%) discontinued because of a TEAE (12 who received CLONXR alone and 5 who received combination therapy). No cardiac-related serious adverse events occurred. After 4 weeks, mean change from baseline in ADHD Rating Scale-IV total score was -13.7, and improvement was sustained throughout the 12-month study (mean at 12 months, -14.6).

Conclusions: Flexible dosing of CLON-XR 0.1 to 0.4 mg/d (twice daily for doses >0.1 mg/d) as monotherapy or in combination with other ADHD medications for up to 1 year was safe and well tolerated. Improvement in efficacy was maintained through month 12.

Ann Neurol. 2011;70:S28-S29.

GENDER DIFFERENCES ACROSS THE LIFESPAN IN NEUROPSYCHOLOGICAL TESTING PERFORMANCE IN ADHD POPULATION FROM THE YEARS 1991-2008.

Fisher BC, Garges DM, Fulda S.

Introduction: Explore differences between males and females (adolescents and adults) in neuropsychological testing performance in diagnosed ADHD population.

Method: A total of 673 adults and adolescents, from age 15 to 73 years were included (419 males) with diagnosed ADHD (Inattentive Type; brain dysfunction/referrals excluded).

Results: Females of all ages performed worse than males on all four trials of PASAT. Significant interaction of depression and gender found with females without depression performing better on Stroop than males without depression and no gender differences for subjects with depression; also depressed females performed worse than non-depressed females, with no difference for males. Males and females did not differ in performance on SDMT and Trail Making Tests.

Conclusions: Gender differences are present across lifespan on tasks of information processing (PASAT). Depression moderates performance on tasks assessing distractibility (Stroop) to a greater degree for females than males. Significant gender differences did not occur systematically on SDMT and Trail Making Tests, which involve speeded performance and whole brain functioning.

Ann Neurol. 2011;70:S155.

CURRENT STATUS OF ADHD TREATMENT IN CHILDREN WITH EPILEPSY: A RETROSPECTIVE, MULTICENTER, CROSS SECTIONAL ANALYSIS IN KOREA.

Kim SJ, Kim KS.

Objective: The purpose of this study was to assess the current therapeutic status of attention deficit-hyperactivity disorder (ADHD) treatment in children with epilepsy.

Methods: A cross-sectional survey of 178 patients aged 4-20 years from ten pediatric neurology departments in eight cities in South Korea from January 2005 to July 2010 was used to assess clinical characteristics of ADHD patients with epilepsy and risk factors associated with ADHD.

Results: A total of 178 pediatric epileptic patients were recruited for this study. One hundred seventy-four subjects' (M:F = 4:1, mean age: 12.2 (plus or minus) 3.3 yrs old) records were evaluated excluding 4 patients due to incomplete data. One hundred twenty-five out of 174 patients (71.8%) had partial seizure disorder, 45 patients had generalized epilepsy. Eighty out of 112 patients showed ADHD combined type in DSM IV. The mean prevalence rate of ADHD treatment among the epileptic patients was 1.9%. Over 45% patients showed complete or persistent symptoms without difficulties in school life with CNS stimulants. Adverse reactions were reported in 19.8% of patients who received ADHD medication. Eighteen patients discontinued ADHD medication due to severe adverse effects such as aggravated seizure activity (5.6%) or ADHD symptoms (3.7%). About 60% of children with ADHD and epilepsy had psychiatric comorbid disorders.

Conclusions: The results indicated that ADHD treatment in epilepsy patients is safe and effective. However, this data also showed that ADHD in pediatric epilepsy patients in Korea are less diagnosed and under-treated than our expectation.

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Ann Neurol. 2011;70:S127-S128.

UTILITY OF OBJECTIVE MEASURES OF ACTIVITY AND ANALYSIS OF ATTENTION STATE IN THE ASSESSMENT OF THERAPEUTIC RESPONSE TO MEDICATIONS IN PATIENTS WITH ADHD: COMMUNITY CARE PERSPECTIVE.

Hasson HJ.

Objective: The NIMH Multimodal Treatment of ADHD Study (MTA) of 579 children with ADHD showed routine community care rendered only about 25% of these patients symptom free. This study is to determine the utility of objective measures of hyperactivity, impulsivity and inattention in a community care setting to achieve optimal therapeutic response to ADHD medications rapidly.

Methods: Patients were evaluated by a board certified Child Neurologist. Patients suspected of having ADHD were tested using the Quotient(registered trademark) ADHD System, a 15 minute computer-based test that combines 6 measures of micro-motion with 13 results from an attention task. Patients meeting the DSM-IV criteria for ADHD were treated and re-assessed in 1-2 weeks.

Results: Of the 35 children included in this series, 15 (43%) achieved normalized motion and attention metrics at the time of the second assessment; 5 (14%) achieved normalized motion control, but excessive inattention remained; 2 (6%) achieved normalized attention, but excessive hyperactivity remained; and 13 (37%) had excessive hyperactivity and inattention. 5 of the 15 patients with normalized motion and attention scores at the time of the second test, were previously treated, but not well controlled at baseline.

Conclusions: It is feasible and practical to implement an objective measurement of hyperactivity and analysis of shifts in attention state using the Quotient ADHD Test in a community care setting. Follow-up studies are needed to determine the time to optimal medication management compared to rating scales, and the impact on compliance, adherence and patient satisfaction.

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Arch Gen Psychiatry. 2011;68:1122-34.

BRAIN GRAY MATTER DEFICITS AT 33-YEAR FOLLOW-UP IN ADULTS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER ESTABLISHED IN CHILDHOOD.

Proal E, Reiss PT, Klein RG, et al.

Context: Volumetric studies have reported relatively decreased cortical thickness and gray matter volumes in adults with attention-deficit/hyperactivity disorder (ADHD) whose childhood status was retrospectively recalled. We present, to our knowledge, the first prospective study combining cortical thickness and voxel-based morphometry in adults diagnosed as having ADHD in childhood.

Objectives: To test whether adults with combined-type childhood ADHD exhibit cortical thinning and decreased gray matter in regions hypothesized to be related to ADHD and to test whether anatomic differences are associated with a current ADHD diagnosis, including persistent vs remitting ADHD.

Design: Cross-sectional analysis embedded in a 33-year prospective follow-up at a mean age of 41.2 years.

Setting: Research outpatient center.

Participants: We recruited probands with ADHD from a cohort of 207 white boys aged 6 to 12 years. Male comparison participants (n=178) were free of ADHD in childhood. We obtained magnetic resonance images in 59 probands and 80 comparison participants (28.5% and 44.9% of the original samples, respectively).

Main Outcome Measures: Whole-brain voxel-based morphometry and vertexwise cortical thickness analyses.

Results: The cortex was significantly thinner in ADHD probands than in comparison participants in the dorsal attentional network and limbic areas (false discovery rate <0.05, corrected). In addition, gray matter was significantly decreased in probands in the right caudate, right thalamus, and bilateral cerebellar hemispheres. Probands with persistent ADHD (n=17) did not differ significantly from those with remitting ADHD (n=26) (false discovery rate <0.05). At uncorrected P <.05, individuals with remitting ADHD had

thicker cortex relative to those with persistent ADHD in the medial occipital cortex, insula, parahippocampus, and prefrontal regions.

Conclusions: Anatomic gray matter reductions are observable in adults with childhood ADHD, regardless of the current diagnosis. The most affected regions underpin top-down control of attention and regulation of emotion and motivation. Exploratory analyses suggest that diagnostic remission may result from compensatory maturation of prefrontal, cerebellar, and thalamic circuitry.

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Bipolar Disord. 2011;13:47-48.

BIPOLAR DISORDER AND ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD): AN USUALLY NEGLECTED COMORBIDITY WITH IMPORTANT IMPLICATIONS.

Goikolea JM, Ramos-Quiroga JA, Torres I, et al.

Introduction: Comorbidity of Bipolar Disorder with Attention Deficit Hyperactivity Disorder has been poorly recognized and studied until now. However, recent studies suggest it may be a prevalent comorbidity with important clinical implications.

Methods: 115 Bipolar I and II patients followed in the Bipolar Disorder Program in Barcelona who were euthymic for at least 3 months were screened for ADHD, by using the ASRS (Adult Self- Report Scale) for adulthood and the WURS (Wender Utah Rating Scale) for retrospective child ADHD. Patients positive in the screening were referred to the Adult ADHD Unit in the Vall d'Hebron Hospital for comprehensive assessment of ADHD with the CAADID (Conners' Adult ADHD Diagnostic Interview for DSM-IV).

Results: 24.3% of the patients had suffered ADHD in childhood and 46.4% of them still suffered adult ADHD (11.3% of the whole sample). Male gender was more frequent in the comorbid group than in the pure BD group (67.9% vs 27.9%). Patients with comorbid ADHD had a lower educational level and were more likely to live with their biological family. Patients with comorbid ADHD showed an earlier onset of the illness (23,8 years vs 29,1 years in the pure bipolar group), and a more severe illness in terms of more hospitalizations and a trend to more manic episodes. This severity could be accounted at least partially by a higher rate of substance use disorders, including alcohol, cannabis, and cocaine use disorders. They had required more psychotherapeutic treatments too.

Conclusions: Comorbidity of Bipolar Disorder with ADHD is underrecognized. These patients show worse outcomes in social and clinical outcomes and they deserve special attention for their early recognition and treatment. More studies on the neurobiological specificities and especially the pharmacological treatment of this comorbidity are urgently needed.

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Bipolar Disord. 2011;13:509-21.

PEDIATRIC BIPOLAR SPECTRUM DISORDER AND ADHD: COMPARISON AND COMORBIDITY IN THE LAMS CLINICAL SAMPLE.

Arnold LE, Demeter C, Mount K, et al.

Objective: To compare attention-deficit hyperactivity disorder (ADHD), bipolar spectrum disorders (BPSDs), and comorbidity in the Longitudinal Assessment of Manic Symptoms (LAMS) study.

Methods: Children ages 6-12 were recruited at first visit to clinics associated with four universities. A BPSD diagnosis required that the patient exhibit episodes. Four hypotheses were tested: (i) children with BPSD + ADHD would have a younger age of mood symptom onset than those with BPSD but no ADHD; (ii) children with BPSD + ADHD would have more severe ADHD and BPSD symptoms than those with only one disorder; (iii) global functioning would be more impaired in children with ADHD + BPSD than in children with either diagnosis alone; and (iv) the ADHD + BPSD group would have more additional diagnoses.

Results: Of 707 children, 421 had ADHD alone, 45 had BPSD alone, 117 had both ADHD and BPSD, and 124 had neither. Comorbidity (16.5%) was slightly less than expected by chance (17.5%). Age of mood symptom onset was not different between the BPSD + ADHD group and the BPSD-alone group. Symptom severity increased and global functioning decreased with comorbidity. Comorbidity with other disorders was highest for the ADHD + BPSD group, but higher for the ADHD-alone than the BPSD-alone group. Children with BPSD were four times as likely to be hospitalized (22%) as children with ADHD alone.

Conclusions: The high rate of BPSD in ADHD reported by some authors may be better explained as a high rate of both disorders in child outpatient settings rather than ADHD being a risk factor for BPSD. Co-occurrence of the two disorders is associated with poorer global functioning, greater symptom severity, and more additional comorbidity than for either single disorder. (copyright) 2011 John Wiley and Sons A/S.

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Bipolar Disord. 2011;13:105.

FUNCTIONAL MRI CORRELATES OF WORKING MEMORY IN PEDIATRIC BIPOLAR DISORDER VERSUS ATTENTION DEFICIT HYPERACTIVITY DISORDER.

Walshaw P, Hegarty C, Perez D, et al.

Introduction: In the current study, we aimed to examine biomarkers for pediatric bipolar disorder that differed from attention deficit hyperactivity disorder (ADHD) during a spatial working memory task. The goal of this study is to begin to elucidate biosignatures that will provide more objective methods for differentiating these two disorders, and would serve to supplement current clinical judgment.

Methods: Twelve youth, ages 7-17, with bipolar disorder were compared to 12 age- and gender-matched youth with ADHD on a task of spatial working memory performed during fMRI. Participants were also matched on task accuracy (>55%). Functional MRI was performed on a Siemens Allegra 3T scanner using a BOLD T2 null-weighted echo-planar imaging sequence (34 slices, 3.0mmx3.0mmx3.0mm voxels, TR=2000, TE=30ms). A co-planar high-resolution structural scan was also collected for registration purposes (TR=5000, TE=33ms). Motion correction was performed using FSL's FLIRT. Scan images were evaluated for usability, excluding those subjects with more than 3.0 mm (1 voxel) of motion during the BOLD sequence. Spatial smoothing was performed using a Gaussian kernel of 5mm FWHM. Signal response was then analyzed for each stage of working memory (encoding, maintenance, and retrieval) using whole-brain mixed-effects analysis.

Results: Results indicate a double-dissociation effect of the BD group having greater activation than the ADHD group only during the maintenance phase of working memory (right and left parahippocampal gyrus, and left medial geniculate nucleus; $Z > 1.7$, $p = 0.05$ corrected) and the ADHD group having greater activation than the BD group only during the retrieval phase of working memory (ventromedial prefrontal cortex (BA12), ventral anterior cingulate (BA32), and left caudate nucleus; $Z > 1.7$, $p = 0.05$ corrected).

Discussion: This study is among the first to directly compare neural biomarkers of pediatric BD and ADHD. Results provide preliminary evidence differing neural networks that are active in pediatric BD and ADHD, with youth with BD relying more heavily on the limbic network during tasks and youth with ADHD utilizing more of a fronto-subcortical network for similar performance.

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BMC Pediatr. 2011;11.

TRAJECTORIES OF GROWTH AND SYMPTOMS OF ATTENTION-DEFICIT/HYPERACTIVITY DISORDER IN CHILDREN: A LONGITUDINAL STUDY.

Heinonen K, Raikkonen K, Pesonen AK, et al.

Background: Empirical evidence suggests that prenatal growth is associated with attention deficit/hyperactivity disorder (ADHD) and its symptoms. Data on the importance of postnatal growth is, however scanty. We studied whether pre- and postnatal growth up to 56 months is associated with symptoms of ADHD in children.

Method: A longitudinal regional birth cohort study comprising 893 children followed up to 56 months. The associations between pre- and postnatal growth and parent-rated ADHD symptoms of the child were analyzed with multiple linear regression analyses and repeated-measures analyses of covariance.

Results: Children born lighter, thinner, shorter, and with a smaller head circumference, adjusted for length of gestation, received higher parent-rated ADHD symptoms scores at 56 months. Further, smaller head circumference throughout the period of growth from birth up to 56 months was related to higher ADHD symptoms scores. The associations changed only little after adjusting for several pre- and neonatal factors. The associations were not modified by sex and there were no evidence of non-linear associations.

Conclusions: Slower prenatal growth in weight, body-mass index, length, and head circumference may pose a risk for higher ADHD symptoms in childhood. The consistently smaller head circumference from birth up to 56 months characterizing children with higher ADHD symptoms may point to a lack of catch-up growth in head circumference in childhood as a predisposing factor.

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BMC Psychiatry. 2011;174.

AVOIDING THE 'TWILIGHT ZONE': RECOMMENDATIONS FOR THE TRANSITION OF SERVICES FROM ADOLESCENCE TO ADULTHOOD FOR YOUNG PEOPLE WITH ADHD.

Young S, Murphy CM, Coghill D.

Attention deficit hyperactivity disorder (ADHD) is a common childhood disorder that frequently persists into adulthood. However, in the UK, there is a paucity of adult services available for the increasing number of young people with ADHD who are now graduating from child services. Furthermore, there is limited research investigating the transition of young people with ADHD from child to adult services and a lack of guidance on how to achieve this effectively. This paper reviews the difficulties of young people with ADHD and their families who are transitioning between services; we review transition from the child and adult health teams' perspectives and identify barriers to the transition process. We conclude with recommendations on how to develop transition services for young people with ADHD.

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BMC Psychiatry. 2011;176.

COMPARATIVE EFFICACY AND ACCEPTABILITY OF METHYLPHENIDATE AND ATOMOXETINE IN TREATMENT OF ATTENTION DEFICIT HYPERACTIVITY DISORDER IN CHILDREN AND ADOLESCENTS: A META-ANALYSIS.

Hanwella R, Senanayake M, de Silva V.

Background: Psychostimulants and non stimulants are effective in the treatment of ADHD. Efficacy of both methylphenidate and atomoxetine has been established in placebo controlled trials. Direct comparison of efficacy is now possible due to availability of results from several head-to-head trials of these two medications.

Methods: All published, randomized, open label or double blind trials, comparing efficacy of methylphenidate with atomoxetine, in treatment of ADHD in children, diagnosed using DSM-IVTM criteria were included. The outcome studied was ADHDRS-IVParent: Inv score. The standardized mean difference (SMD) was used as a measure of effect size.

Results: Nine randomized trials comparing methylphenidate and atomoxetine, with a total of 2762 participants were included. Meta-analysis did not find a significant difference in efficacy between methylphenidate and atomoxetine (SMD= 0.09, 95% CI -0.08-0.26) (Z=1.06, p=0.29). Synthesis of data from eight trials found no significant difference in response rates (RR=0.93 95% CI 0.76-1.14, p=0.49). Sub group analysis showed a significant standardized mean difference favouring OROS methylphenidate (SMD=0.32, 95% CI 0.12-0.53 (Z=3.05, p<0.002). Immediate release methylphenidate was not superior to atomoxetine (SMD= -0.04, 95% CI -0.19-0.12) (Z=0.46, p=0.64). Excluding open label trials did not significantly alter the effect size (SMD=0.08, 95% CI -0.04-0.21) (Z=1.27, p=0.20). All-cause discontinuation was used as a measure of acceptability. There was no significant difference in all cause discontinuation between atomoxetine and methylphenidate (RR 1.22, 95% CI 0.87-1.71). There was significant heterogeneity among the studies (p=0.002, I²=67%). Subgroup analysis demonstrated the heterogeneity to be due to the open label trials (p=0.001, I²=81%).

Conclusions: In general atomoxetine and methylphenidate have comparable efficacy and equal acceptability in treatment of ADHD in children and adolescents. However OROS methylphenidate is more effective than atomoxetine and may be considered as first line treatment in treatment of ADHD in children and adolescents.

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Brain Topogr. 2011;24:243-52.

CHANGES OF BRAIN STRUCTURE AND FUNCTION IN ADHD CHILDREN.

Qiu MG, Ye Z, Li QY, et al.

To explore the changes of brain structure and function in attention-deficit/hyperactivity disorder (ADHD), fifteen ADHD patients (inattention subtype) and 15 normal control participants were recruited, the brain structure and function of these subjects were investigated by combining structural magnetic resonance imaging (MRI), diffusion tensor imaging and resting-state functional MRI. The results showed that ADHD patients had a significant decrease in the volume of the white matter ($P = 0.04$), and a trend toward decreased volume of brain structures except for the putamen and globus pallidus. The visualization of statistical difference maps of the cortical thickness showed that ADHD patients had focal thinning in bilateral frontal regions and the right cingulate cortex ($P < 0.05$ uncorrected, except for a cluster threshold of 10 voxels). Statistical analysis of the FA maps revealed that ADHD patients had significantly decreased FA in the forceps minor, the internal capsule, the corona radiata, the splenium of the corpus callosum, and the bilateral basal ganglia ($P < 0.05$ uncorrected as above). ADHD patients had significantly decreased functional connectivity in the anterior cingulate cortex, posterior cingulate cortex, lateral prefrontal cortex, left precuneus and thalamus, but increased functional connectivity in bilateral posterior medial frontal cortex in the default mode network ($P < 0.05$ uncorrected as above). Our results provide new insights into the changes of the brain structure and function in ADHD, which suggests that alterations in the brain structural and functional connectivity might implicate the pathophysiology of ADHD.

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Br J Psychiatry. 2011;199:398-403.

CLINICAL AND COGNITIVE CHARACTERISTICS OF CHILDREN WITH ATTENTION-DEFICIT HYPERACTIVITY DISORDER, WITH AND WITHOUT COPY NUMBER VARIANTS.

Langley K, Martin J, Agha SS, et al.

Background: Submicroscopic, rare chromosomal copy number variants (CNVs) contribute to neurodevelopmental disorders but it is not known whether they define atypical clinical cases.

Aims: To identify whether large, rare CNVs in attention-deficit hyperactivity disorder (ADHD) are confined to a distinct clinical subgroup.

Method: A total of 567 children with ADHD aged 5-17 years were recruited from community clinics. Psychopathology was assessed using the Child and Adolescent Psychiatric Assessment. Large, rare CNVs (>500 kb, $<1\%$ frequency) were defined from single nucleotide polymorphism data.

Results: Copy number variant carriers (13.6%) showed no differences from non-carriers in ADHD symptom severity, symptom type, comorbidity, developmental features, family history or pre-/perinatal markers. The only significant difference was a higher rate of intellectual disability (24% v. 9%, $(\chi^2) = 15.5$, $P = 0.001$). Most CNV carriers did not have intellectual disability.

Conclusions: Large, rare CNVs are not restricted to an atypical form of ADHD but may be more highly enriched in children with cognitive problems.

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Chin Med J. 2011;124:3269-74.

PROSPECTIVE, NATURALISTIC STUDY OF OPEN-LABEL OROS METHYLPHENIDATE TREATMENT IN CHINESE SCHOOL-AGED CHILDREN WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER.

Zheng Y, Wang YF, Qin J, et al.

Background Attention deficit hyperactivity disorder (ADHD) is one of the most common mental disorders during childhood, characterized by the core symptoms of hyperactivity, impulsivity and inattention and puts great burden on children themselves, their families and the society. Osmotic release oral system methylphenidate (OROS-MPH) is a once-daily controlled-release formulation developed to overcome some of the limitations associated with immediate-release methylphenidate (IR-MPH). It has been marketed in China since 2005 but still lacks data from large-sample clinical trials on efficacy and safety profiles. The aim of this study was to evaluate the effectiveness and safety of OROS-MPH in children aged 6 to 16 years with ADHD under naturalistic clinical setting.

Methods This 6-week, multi-center, prospective, open-label study enrolled 1447 ADHD children to once-daily OROS-MPH (18 mg, 36 mg or 54 mg) treatment. The effectiveness measures were parent-rated Inattention and Overactivity With Aggression (IOWA) Conners I/O and O/D subscales, physician-rated CGI-I and parent-rated global efficacy assessment scale. Blood pressure, pulse rate measurement, adverse events (AEs) and concomitant medications and treatment review were conducted by the investigator and were served as safety measures.

Results A total of 1447 children with ADHD (mean age (9.52(plus or minus)2.36) years) were enrolled in this trial. Totally 96.8% children received an OROS-MPH modal dose of 18 mg, 3.1% with 36 mg and 0.1% with 54 mg at the endpoint of study. The parent IOWA Conners I/O score at the end of week 2 showed statistically significant ($P < 0.001$) improvement with OROS-MPH (mean: 6.95(plus or minus)2.71) versus the score at baseline (10.45(plus or minus)2.72). The change in the parent IOWA Conners O/D subscale, CGI-I and parent-rated global efficacy assessment scale also supported the superior efficacy for OROS-MPH treatment. Fewer than half of 1447 patients (511(35.3%)) reported AEs, and the majority of the events reported were mild (68.2%). No serious adverse events were reported during the study.

Conclusion This open-label, naturalistic study provides further evidence of effectiveness and safety of OROS-MPH in school-aged children under routine practice.

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Clinical Child and Family Psychology Review. 2011 Sep;14:318-28.

FUNCTIONAL IMPAIRMENT IN LATINO CHILDREN WITH ADHD: IMPLICATIONS FOR CULTURALLY APPROPRIATE CONCEPTUALIZATION AND MEASUREMENT.

Haack LM, Gerdes AC.

Conceptualizing and measuring functional impairment related to childhood ADHD, particularly within the rapidly growing, yet underserved, Latino population, is an important area of research that is in its infancy in the field of psychology. The functional impairments related to academic achievement, social competence, and familial relations experienced by children with ADHD lead to long-lasting and debilitating difficulties that adversely affect the individuals themselves, their families, and society. In addition, limited available research suggests that Latino children are at a great or greater risk for developing ADHD, although they are much less likely to be identified by their parents as displaying problematic behavior and subsequently are less likely to receive proper assessment and treatment due to several practical and cultural factors. Fortunately, initial evidence suggests that the construct of functional impairment may be a more universal notion than the potentially culturally biased measurement of symptomatology. Therefore, in order to provide the best possible outcomes for all children with ADHD, research needs to be expanded to include examination of functional impairment related to ADHD, particularly when working with Latino children and their families. Thus, the primary aim of the current review is to examine and critique how the field of psychology has understood and measured functional impairment in school-aged Latino children with ADHD to date. Based on information reviewed, suggestions for moving toward a culturally modified assessment of functional impairment related to ADHD in Latino children will be proposed. This work is a necessary step toward providing culturally appropriate services for a currently underserved, yet rapidly growing, Latino population in our country.

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Clin Child Psychol Psychiatry. 2011 Oct;16:599-619.

MAKING SENSE OF ADHD IN PRACTICE: A STAKEHOLDER REVIEW.

Kildea S, Wright J, Davies J.

The study aimed to explore and synthesize stakeholders' conceptualizations and solutions concerning ADHD in the context of CAMHS. The participants were 28 stakeholders consisting of seven mental health professionals, two teachers, seven parents/carers, five children referred for an ADHD assessment, two siblings and five peers. Individual, semi-structured interviews were held with all professionals and parents/carers. The children's interviews used methods tailored for junior age children and were semi-structured, individual and in a group format for the peers. All interviews were transcribed verbatim and the children's pictures were analysed. A thematic analysis was undertaken with ADHD thematically emerging

as a confusing mess with conflicts reverberating across all levels of analysis from the intra-psychic world of the child to wider social contexts. Professionals attempt to make sense of this mess, parents experience the emotional impact of the mess and children's identities are shaped by it. A reflective space where complexity, uncertainty and hidden feelings are thought about is postulated to reduce confusion and dissonance, and which in turn would enable the system to become more self aware and less naïve.

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Clin Child Psychol Psychiatry. 2011 Oct;16:535-50.

AN EXPLORATION OF FAMILY DYNAMICS AND ATTACHMENT STRATEGIES IN A FAMILY WITH ADHD/CONDUCT PROBLEMS.

Dallos R, Smart C.

This article reports the preliminary findings of a study of attachment patterns and relationship themes using the TAAI (Transition to Adulthood Attachment Interview), AAI (Adult Attachment Interview) and family interviews (based on the first of 15 families). Research data is presented on a young man aged 16 with a diagnosis of ADHD and his family. Individual interviews, attachment interviews, and family interviews were conducted in order to explore the link between family dynamics, ADHD and attachment strategies. In contrast to findings from existing research indicating pre-occupied patterns for young people diagnosed with ADHD, the young man displayed a complex 'disoriented' attachment pattern which primarily featured a dismissive strategy. However, this was combined with pre-occupied patterns triggered by intrusions from unresolved traumas and memories of his parents' continuing unresolved conflicts. His sense of confusion and lack of a coherent strategy appeared to be closely related to his position of being triangulated into his parents' conflicts. Trans-generational processes were also influential, in that the parents' corrective intentions at more positive parenting were impeded by their own lack of experience of positive attachments in their own childhoods. The study emphasizes the need to consider the relationship between attachment patterns and problems within wider systemic process in the family, in particular triangulation and corrective scripts.

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Clin Neurophysiol. 2011.

CLINICALLY-ORIENTED MONITORING OF ACUTE EFFECTS OF METHYLPHENIDATE ON CEREBRAL HEMODYNAMICS IN ADHD CHILDREN USING fNIRS.

Monden Y, Dan H, Nagashima M, et al.

Objective: Attention Deficit Hyperactivity Disorder (ADHD), a common developmental syndrome with inattention, hyperactivity, and impulsivity, is typically treated with the psychostimulant drug, methylphenidate (MPH). We explored the feasibility of using functional near-infrared spectroscopy (fNIRS) to search for a clinically implementable biological marker for the acute MPH effect on ADHD children.

Methods: Following an MPH washout period, twelve ADHD children performed a go/no-go task before and 1.5 h after MPH intake. fNIRS was used to monitor the lateral prefrontal cortical hemodynamics of ADHD children performing a go/no-go task.

Results: There was no significant activation in the lateral prefrontal cortices examined before MPH intake. However, after MPH intake, significant MPH-elicited activation (oxygenated hemoglobin signal increase) was detected in the right lateral prefrontal cortex (LPFC) implicated with response inhibition functions. There was a large significant correlation between increases in task performance and activation in the right LPFC.

Conclusions: The improved cognitive performance was associated with activation in the right LPFC, which might serve as a biological marker to monitor the effect of MPH in ADHD children.

Significance: MPH-effect assessment in ADHD children using fNIRS can be performed within a 3 h stay at a hospital during a single visit, and thus may be integrated into clinical practice.

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Cogn Behav Pract. 2011 Nov;18:530-44.

AN EVALUATION OF A SUMMER TREATMENT PROGRAM FOR ADOLESCENTS WITH ADHD.

Sibley MH, Pelham WE, Evans SW, et al.

Although adolescents with attention-deficit/hyperactivity disorder (ADHD) experience serious life impairment (Molina et al., 2009; Wolraich et al., 2005), very few effective psychosocial interventions exist to treat this population (Pelham & Fabiano, 2008; Smith, Waschbusch, Willoughby, & Evans, 2000). Intensive child-directed interventions are an important component in the treatment of childhood ADHD (Pelham et al., 2005), yet no study exists that fully evaluates an intensive adolescent-directed intervention. The current investigation is a pilot study of 19 adolescents with ADHD (age range: 11-16) who participated in an 8-week intensive Summer Treatment Program–Adolescent (STP-A) during the summer of 2009. The program was developed to address specific difficulties associated with ADHD in adolescence. As such, the program was designed to be ecologically valid, age appropriate, and parent-involved. Results suggest that almost all adolescents who attended the STP-A benefitted from the program according to parent, self, and staff ratings and objective measures. These ratings also indicated that participants showed moderate improvement in each of the 6 domains targeted by treatment (i.e., conduct problems, adult-directed defiance, social functioning, inattention/disorganization, mood/well-being, and academic skills). All parents indicated that both they and their children benefitted from the program and all but 1 parent indicated that the STP-A was more effective than the treatments they had utilized in the past. A case example is presented to illustrate typical improvement patterns during the STP-A. Discussion addresses the role of the STP-A in the treatment of ADHD in adolescence.

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Cogn Ther Res. 2011;35:442-55.

IF-THEN PLANS BENEFIT DELAY OF GRATIFICATION PERFORMANCE IN CHILDREN WITH AND WITHOUT ADHD.

Gawrilow C, Gollwitzer PM, Oettingen G.

Children with impulse control deficits (i.e., children with ADHD) are known to have special problems with delaying gratifications. As making if-then plans (i.e., forming implementation intentions) has been found to benefit self-control even in individuals whose action control is chronically hampered (e.g., critical samples such as patients with frontal lobe damage, the elderly), we analyzed whether delay of gratification is facilitated in children with and without ADHD who have formed respective implementation intentions. In Study 1, forty-five inpatient children with ADHD (Mage = 10.7 years) increased delay of gratification performance after having formed respective implementation intentions. Study 2 replicated this finding in an outpatient sample of children with ADHD (n = 47, Mage = 10.3 years) and also in a comparison group of children without ADHD (n = 40, Mage = 11.3 years). Results are discussed with respect to their implications for action control in children with ADHD as well as research on implementation intentions and delay of gratification.

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Curr Opin Pediatr. 2011;23:684-92.

CLINICAL DIAGNOSIS AND MANAGEMENT OF ATTENTION DEFICIT HYPERACTIVITY DISORDER IN PRESCHOOL CHILDREN.

Kaplan A, Adesman A.

PURPOSE OF REVIEW: To provide an overview of clinical advances and research findings related to attention deficit hyperactivity disorder (ADHD) in preschool children, with an emphasis on assessment and management.

RECENT FINDINGS: The American Academy of Pediatrics has just released new clinical practice guidelines for the diagnosis and management of ADHD. These guidelines are broader in scope, now extending down to preschool children (ages 4 and 5 years). With respect to diagnosis, the American Psychiatric Association has recently proposed modifications to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV); the current draft version of DSM-V includes changes to the diagnosis criteria for ADHD. With respect to treatment of preschool children with ADHD, studies continue to support the efficacy of behavioral interventions. Regarding pharmacotherapy, a large, recently completed, placebo-

controlled study of methylphenidate for preschool ADHD identified some age-related medication differences.

SUMMARY: ADHD can be reliably diagnosed in preschool children. Behavior therapy remains the recommended first-line treatment approach; pharmacotherapy is sometimes indicated as a treatment adjunct, or, less commonly, a treatment alternative.

Dev Med Child Neurol. 2011;53:54-55.

CHANGES IN THE PREVALENCE AND MANAGEMENT OF ADHD, AND THE IMPACT ON CHILDREN'S COMMUNITY SERVICES: AN 8-YEAR FOLLOW-UP STUDY.

Parr J.

Objectives: To investigate the change in detected prevalence, demographics, referral patterns, diagnostic procedures and management of these children with attention-deficit-hyperactivity disorder (ADHD) in the Wirral, Merseyside, UK between 2000 and 2008.

Background: ADHD is common, assessment and management requires considerable resources. In 2000, Parr et al identified 420 children with ADHD in the Wirral population (Parr et al, 2000).

Design/Method: A case note study from 2007-2008 identified cases from a database. Data was then compared with published findings from 2000.

Results: In 2008, 830 children and young people were identified as having ADHD, compared with 420 children in 2000. The detected prevalence in 5- to 16-year-old was 13/1000 in 2008. In 2008, 23% of referrals were from GPs, with a similar proportion from school nurses. In 2000, the male-female ratio was 12:1; by 2008 it had reduced to 9:2. Mean age at diagnosis in 2008 was 8.4 years compared to 8.7 years in 2000. In the 2008 study, 21% of children identified were over age 16 years. In 2008, questionnaires were used in 69% of diagnoses compared with 57% in 2000. By the number of referrals, the 54 EACD Abstracts proportion of children visited at school reduced from 80% before 2000, to 60% by 2008. In contrast to the 2000 findings, the majority of the 2008 families (69.6%) were referred for behaviour management. In keeping with 2000 findings, over 90% of children were on medical treatment in 2008. Mean daily dose of methylphenidate was 0.8mg/ kg/day; 29% of children were on a long acting stimulant preparation. Response to medical therapy at home and school was documented in 72% of children.

Conclusions: Between 2000 and 2008, detected prevalence of ADHD in Wirral increased, putting considerable strain on clinical services. There is a lack of resources for children with ADHD aged over 16 years and many continue to be managed by children's services.

Dev Med Child Neurol. 2011;53:5-6.

SLEEP DISTURBANCES ASSOCIATED WITH ATTENTION DEFICIT-HYPERACTIVITY DISORDER.

Cortese S.

Although usually overlooked in the clinical practice, sleep complaints in children referred for attention-deficit-hyperactivity disorder (ADHD) symptoms are quite frequent. Gaining insights into sleep disturbances associated with ADHD is of relevance for several reasons. First, sleep disturbances can be a significant source of distress for children with ADHD and/or their parents. Second, alterations in sleep may worsen diurnal symptoms of ADHD. Third, sleep disturbances may mimic ADHD in children referred for symptoms of inattention and/or hyperactivity-impulsivity but who do not meet criteria for ADHD. Fourth, the identification of possible intrinsic differences in sleep in a subset of children with ADHD may help elucidate potential common pathophysiological mechanisms underlying both sleep alterations and ADHD symptoms. The presentation will review and critically discuss the following: (1) The prevalence and types of sleep disturbances/disorders associated with ADHD, including sleep-onset delay, increased nocturnal motor activity, restless legs syndrome, periodic limb movements in sleep, sleep-disordered breathing, deficit in alertness, and sleep alterations accounted for by comorbid psychiatric disorders or ADHD medications; (2) The clinical management (pharmacological and non-pharmacological) of the most common sleep disturbances associated with ADHD; (3) The Keynote Lectures and Invited Speakers 5 behavioral and

pathophysiological mechanisms underlying the association between alterations in sleep patterns and ADHD; (4) Future avenues of research in the field.

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Dev Med Child Neurol. 2011;53:6.

THERAPEUTIC STRATEGIES IN ADHD.

Van Bogaert P.

Attention-deficit-hyperactivity disorder (ADHD) is a frequent disorder, with a prevalence ranging from 3 to 10% in school-aged children, depending on series and definition criteria. Its etiology is unknown and probably not unique in most cases. Actual hypotheses favour a genetic background but superimposed environmental factors like inadequate familial environment or preterm birth may be preponderant in some cases. Guidelines for treatment were published in 1998 (with first upgrade in 2004) in Europe and in 2001 in US. These guidelines recommend considering ADHD as a chronic disorder that is diagnosed using comprehensive developmental, social and family history, standardized checklists to assess behaviours, and a search for frequently associated mental health disorders. Nonpharmacological interventions (psychoeducational measures, parent training and behavioural interventions in the family and in the school, individual cognitive behavior therapy) and pharmacological treatment with methylphenidate (MPH) are both efficacious and are often combined. Studies aimed at comparing the two types of approaches have shown the superiority of MPH in the short term. This effect was maintained at 2 years, but, at 3 years, the multimodal treatment of ADHD research program has shown that the difference between the two approaches was not statistically significant, patients remaining however improved compared to the baseline behavioural evaluation. This research program has also pointed to an increased risk of substance abuse in MPH treated patients. Therefore, the longterm use of MPH must be balanced between possible side effects (arterial hypertension, growth delay, sleep disturbances, substance abuse) and reduced efficacy over time. Most studies evaluated the efficacy of MPH on behavioural items. Considering the cognitive model proposing ADHD as a result of impaired inhibitory control, which makes the child less flexible to changing circumstances, search for an effect of MPH on executive functions is also of interest. We conducted a double-blind study where boys aged 6 to 12 years diagnosed with ADHD and responders to immediate-release MPH were randomized between placebo and long-acting (Osmotic Release Oral System, OROS) MPH. Evaluation occurred 8 hours after drug intake. Results showed a significant effect of MPH on continuous performance tests, with less variable and reduced reaction times, and on counting Stroop test with less interference. These data support a cognitive effect of MPH in addition to its behavioural effect. In conclusion, treatment of ADHD needs to be tailored with special concern for associated conditions as psycho-affective problems or learning difficulties. In cases where there is a positive response to MPH, treatment should be re-evaluated periodically as the longterm effect is less clear than short-term response.

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Dev Med Child Neurol. 2011;53:60.

SYMPTOMS OF ADHD AT AGE 7 AND 10 PREDICT ACADEMIC OUTCOME AT AGE 16.

Holmberg K, Bolte S.

Objective: To examine if symptoms of ADHD at age 7 and 10 predict academic outcome at age 16 in Swedish schoolchildren.

Methods: Cohort study of 591 ninth graders (16-year-olds) in one municipality in Stockholm County. All children had been screened for ADHD-symptoms in first and fourth grade using 10-item parental and teacher Conners' ratings of behavioral problems, teacher reports on the ADHD symptom scale based on DSM-IV in fourth grade, followed by a clinical assessment of ADHD. Final grades at age 16 were obtained for 560 children. Conners' ratings from both parents and teachers as well as final grades were available from 405 first graders and 511 fourth graders. Prediction of school outcome (grade point average in ninth grade, and qualification for high-school) by Conners' ratings (parent/teacher items and total scores) and DSM-IV checklist (single and total symptoms rated by teacher) was calculated using logistic and multiple linear regression models. Sensitivity and specificity for predictors regarding qualification for high-school were determined.

Results: The best predictor at ages 7 and 10 for school outcome at age 16 yielded parental or teacher rating of inattentiveness or reports of problems for the child to finish tasks with a high specificity (90-99%) but low sensitivity (12-39%) for high-school qualification. Symptoms of inattention at age 7 and 10 years as well as ADHD in 10-year-olds were associated with lower grade point average at the age of 16 and not being qualified for upper secondary school.

Conclusions: This study demonstrates a connection between mild as well as more severe ADHD-symptoms in young schoolchildren and underachievement in grade nine. Early recognition of attention problems by screening with a short questionnaire followed by effective interventions has a potential to improve the prognosis in terms of educational outcomes. However, sensitivity and specificity scores reveal that practical applicability is compromised.

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Drug Alcohol Depend. 2011.

THE ROLE OF CONDUCT DISORDER IN THE ASSOCIATION BETWEEN ADHD AND ALCOHOL USE (DISORDER). RESULTS FROM THE NETHERLANDS MENTAL HEALTH SURVEY AND INCIDENCE STUDY-2.

Tuithof M, ten Have M, van den Brink W, et al.

Background: Much is unclear about the association between attention-deficit/hyperactivity disorder (ADHD) and alcohol use (disorder). Research on this subject is hindered by the role of conduct disorder (CD). We investigate whether (1) childhood ADHD is associated with higher prevalence and earlier onset of alcohol initiation, regular alcohol use and alcohol use disorder (AUD) (2) CD mediates or modifies this association.

Methods: Data were derived from the baseline assessment of the Netherlands Mental Health Survey and Incidence Study-2, a general population study. ADHD and CD were assessed among respondents aged 18-44 (n = 3309). ADHD, CD, and alcohol use (disorder) were assessed using the Composite International Diagnostic Interview 3.0.

Results: Lifetime prevalence was 2.9% for ADHD, 5.6% for CD, 94.3% for alcohol initiation, 85.7% for regular alcohol use and 19.0% for AUD; mean ages of onset were 6.7, 11.5, 14.8, 16.7 and 19.2 years, respectively. After correction for gender and age, ADHD was associated with a higher prevalence of all three stages of alcohol use, but not with earlier onset of these stages. The association between ADHD and prevalence of AUD was fully explained by a mediating role of CD. CD did not modify the associations between ADHD and prevalence and onset of alcohol use (disorder).

Conclusions: The mediating role of CD in the association between ADHD and AUD suggests a developmental pathway from ADHD to CD and subsequent AUD. Early interventions in children with ADHD may prevent CD and subsequent onset of AUD. (copyright) 2011 Elsevier Ireland Ltd. All rights reserved.

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Environ Res. 2011;111:1330-31.

CAPTOPRIL AS A NOVEL POSSIBLE TREATMENT FOR CHILDREN WITH ADHD AND ELEVATED LEAD LEVEL, A HYPOTHESIS.

Ghanizadeh A.

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European Child & Adolescent Psychiatry. 2011 Oct;20:S289-S296.

ASSESSMENT OF DAILY PROFILES OF ADHD AND ODD SYMPTOMS, AND SYMPTOMATOLOGY RELATED TO ADHD MEDICATION, BY PARENT AND TEACHER RATINGS .

Breuer D, Görtz-Dorten A, Rothenberger A, et al.

DAYAS is a new two-part rating scale that assesses: (1) ADHD and ODD symptoms (externalising symptom ratings) and (2) symptomatology potentially related to ADHD medication (potentially medication-related symptoms) in real-world settings at different time periods throughout a normal school day. Data from a proof-of-concept study and two observational trials (Medikinet[®] retard [methylphenidate]

and the Equasym XL[®] [methylphenidate] OBSEER study) evaluated: (1) validity of weekly externalising symptom ratings using DAYAS, in place of daily ratings; (2) reliability and internal consistency of DAYAS ratings for externalising symptoms and potentially medication-related symptoms; and (3) convergent and divergent validity of the externalising symptom ratings with existing validated scales. From the proof-of-concept study, daily scores by period of day and during the whole day correlated strongly with equivalent weekly scores ($r = 0.83-0.92$). Internal consistency of externalising symptom rating scales calculated from pooled data were acceptable or good by period of day (Cronbach's $\alpha = 0.68-0.90$) and very high for whole day scores (Cronbach's $\alpha = 0.88-0.95$). Internal consistency of the rating scale for potentially medication-related symptoms was also good for both teacher and parent ratings. From OBSEER data, correlations between FBB-ADHD total symptom scores and ratings on both parent and teacher versions of DAYAS were high ($r = 0.73$ and $r = 0.84$, respectively). Correlations between DAYAS and SDQ were highest for the SDQ subscales hyperactivity and conduct problems and substantially lower for pro-social behaviour, peers and emotional problems. The DAYAS rating scale had good internal consistency, and DAYAS scores correlated well with existing validated scales and the SDQ subscales hyperactivity and conduct problems. Weekly DAYAS scores (whole day and by period of day) could be considered a suitable replacement for daily assessment scores.

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Eur J Clin Pharmacol. 2011;67:1061-67.

ONE-YEAR PROSPECTIVE FOLLOW-UP OF PHARMACOLOGICAL TREATMENT IN CHILDREN WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER.

Didoni A, Sequi M, Panei P, et al.

Objectives: To delineate the safety and tolerability profile of methylphenidate and atomoxetine in children and adolescents with attention deficit hyperactivity disorder (ADHD) monitored for more than 1 year.

Design: A cohort study analyzing data from the national ADHD register on patients from the Lombardy Region treated with MPH or atomoxetine.

Participants: A total of 229 children (median age 11 years, range 6-17), enrolled in 15 regional centers between June 2007 and May 2010.

Results: The prevalence rate of pharmacological treatment for ADHD was 0.23%, whereas the estimated ADHD prevalence in the population was 0.95%. In total, 73.8% of patients had been treated with atomoxetine (10-90 mg daily) or MPH (10-75 mg daily); 22% of patients also received an additional psychotropic drug. Of the treated children, 26.9% discontinued the drug prior to 1 year of treatment, mostly because of adverse effects (28.6%). No new or unexpected adverse events (rate 39.2%) were encountered. Decreased appetite, headache, and unstable mood were the leading events. The most severe events occurred in two boys: one experienced absence seizures for the first time with MPH, the other experienced hallucinations with atomoxetine. Therapy was discontinued in ten male patients (7.7%) because of adverse events. All patients with adverse effects recovered well.

Conclusions: A very low rate of ADHD prevalence was estimated in Italian children compared to that reported in other countries. Although the medications for ADHD are generally well tolerated, with only mild or minor adverse effects in most cases, their rational use can only be guaranteed by disseminating and monitoring evidence-based practices and by monitoring the safety and efficacy of treatments in both the short and long terms with appropriate tools and approaches.

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Genes Brain Behav. 2011;10:844-51.

CDH13 IS ASSOCIATED WITH WORKING MEMORY PERFORMANCE IN ATTENTION DEFICIT/HYPERACTIVITY DISORDER.

Arias-Vasquez A, Altink ME, Rommelse NNJ, et al.

Different analytic strategies, including linkage, association and meta-analysis support a role of CDH13 in the susceptibility to attention deficit/hyperactivity disorder (ADHD). CDH13 codes for cadherin 13 (or H-cadherin), which is a member of a family of calcium-dependent cell-cell adhesion proteins and a regulator of neural cell growth. We tested the association between CDH13 on three executive functioning tasks that are promising endophenotypes of ADHD. An adjusted linear regression analysis was performed in 190

ADHD-affected Dutch probands of the IMAGE project. Three executive functions were examined: inhibition, verbal and visuo-spatial working memory (WM). We tested 2632 single nucleotide polymorphisms (SNPs) within CDH13 and 20 kb up- and downstream of the gene (capturing regulatory sequences). To adjust for multiple testing within the gene, we applied stringent permutation steps. Intronic SNP rs11150556 is associated with performance on the Verbal WM task. No other SNP showed gene-wide significance with any of the analyzed traits, but a 72-kb SNP block located 446 kb upstream of SNP rs11150556 showed suggestive evidence for association (P-value range 1.20E-03 to 1.73E-04) with performance in the same Verbal WM task. This study is the first to examine CDH13 and neurocognitive functioning. The mechanisms underlying the associations between CDH13 and the clinical phenotype of ADHD and verbal WM are still unknown. As such, our study may be viewed as exploratory, with the results presented providing interesting hypotheses for further testing.

Health Serv Outcomes Res Methodol. 2011;1-19.

CHARACTERIZING PATTERNS OF CARE USING ADMINISTRATIVE CLAIMS DATA: ADHD TREATMENT IN CHILDREN.

Klein GR, Greenhouse JB, Stein BD, et al.

Comparative effectiveness research (CER) is concerned with determining which treatment, among known effective treatments, may provide the most benefit to an individual patient. CER stresses treatment in the "real-world," taking into account multiple sources of patient, provider, and treatment heterogeneity. This is opposed to randomized clinical trials which may enforce strict treatment guidelines and may exclude patient populations from participation. One way to access treatment outcomes in these general settings is through administrative databases such as Medicaid claims. While they usually have variables linking records to individual patients over time, we believe a strategy that may aid in CER is to use administrative databases longitudinally. We describe two approaches that can be used with administrative data to characterize longitudinal patterns of treatment, trajectory analysis and multi-state Markov models. We apply these models to Medicaid retail pharmacy claims and behavioral service claims to describe the attention deficit hyperactivity disorder treatment patterns in youths in general clinical settings.

Horm Res Paediatr. 2011;76:179.

SYMPTOMS OF ADHD AND DEPRESSION IN A CLINICAL POPULATION OF OBESE CHILDREN: RELATIONS WITH BMI AND METABOLIC SYNDROME PANAGIOTA PERVANIDOU¹.

Gkourogianni A, Syros I, Kanaka-Gantenbein C, et al.

Background: High rates of behavioural and emotional symptoms have been reported in obese children. Both behavioural and neuroendocrine pathways contribute to high rates of comorbidity between emotional and behavioural disorders and obesity.

Objective and hypotheses: The aim of our study was to assess the prevalence of symptoms of Attention Deficit Disorder (ADD) and depression among a clinical population of children followed at the Childhood Obesity Clinic of our Department. Furthermore, to examine relations between such symptoms and BMI z-scores and parameters of the metabolic syndrome.

Methods: A total of 74 (51 females) obese children, aged 7-16, were examined for symptoms of ADD and depression. Parents were asked to complete an ADHD questionnaire, based on DSM-IV diagnostic criteria. Children completed the Children's Depression Inventory (CDI).

Results: Eleven out of 74 (14.8%) obese children presented with a high level (over the diagnostic cut-off point) of symptoms of ADD. Sixteen children (21.6%) presented with diagnostic symptoms of depression. Seven additional children (9.5%) had comorbid diagnostic symptoms of ADD and depression. The group with ADD symptoms had significantly higher BMI z-scores compared to the total non-ADD group ($p=0.002$). Furthermore, children with ADD symptoms had higher BMI z-scores compared to obese children with symptoms of depression and obese children with comorbid symptoms. However, the group with comorbid symptoms had the higher prevalence of parameters of the metabolic syndrome compared to the other groups.

Conclusions: A high prevalence of symptoms of ADD and depression is noted in a clinical population of obese children compared to the general population. Children with ADD symptoms, have a higher BMI z-score while children with comorbid ADD and depression have a greater number of parameters of Metabolic Syndrome compared to the other groups.

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Hum Brain Mapp. 2011.

BROADBAND NEUROPHYSIOLOGICAL ABNORMALITIES IN THE MEDIAL PREFRONTAL REGION OF THE DEFAULT-MODE NETWORK IN ADULTS WITH ADHD.

Wilson TW, Franzen JD, Heinrichs-Graham E, et al.

Previous investigations of the default-mode network (DMN) in persons with attention-deficit/hyperactivity disorder (ADHD) have shown reduced functional connectivity between the anterior and posterior aspects. This finding was originally demonstrated in adults with ADHD, then in youth with ADHD, and has been tentatively linked to ultra low frequency oscillations within the DMN. The current study evaluates the specificity of DMN abnormalities to neuronal oscillations in the ultra low frequency range, and examines the regional specificity of these DMN aberrations in medicated and unmedicated adults with, and those without ADHD. An individually matched sample of adults with and without ADHD completed 6-minute sessions of resting-state magnetoencephalography (MEG). Participants with ADHD were known responders to stimulant medications and completed two sessions (predrug/postdrug). MEG data were coregistered to the participant's MRI, corrected for head motion, fitted to a regional-level source model, and subjected to spectral analyses to extract neuronal population activity in regions of the DMN. The unmedicated adults with ADHD exhibited broadband deficits in medial prefrontal cortices (MPFC), but not other DMN regions compared to adults without ADHD. Unmedicated patients also showed abnormal cross-frequency coupling in the gamma range between the MPFC and posterior cingulate areas, and disturbed balance within the DMN as activity in posterior regions was stronger than frontal regions at beta and lower frequencies, which dissipated at higher (gamma)-frequencies. Administration of pharmacotherapy significantly increased prefrontal alpha activity (8-14 Hz) in adults with ADHD, and decreased the cross-frequency gamma coupling. These results indicate that neurophysiological aberrations in the DMN of patients with ADHD are not limited to ultra slow oscillations, and that they may be primarily attributable to abnormal broadband activity in the MPFC. Hum Brain Mapp, 2011.

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Int J Neuropsychopharmacol. 2011;14:1399-410.

VAL/VAL GENOTYPE OF BRAIN-DERIVED NEUROTROPHIC FACTOR (BDNF) VAL 66MET POLYMORPHISM IS ASSOCIATED WITH A BETTER RESPONSE TO OROS-MPH IN KOREAN ADHD CHILDREN.

Kim BN, Cummins TDR, Kim JW, et al.

Research on psychostimulants, analysis of animal models and genetic association studies all suggest that the brain-derived neurotrophic factor gene (BDNF) may be a good candidate for pharmacogenetic studies of attention deficit hyperactivity disorder (ADHD). Yet to date there have been no pharmacogenetic studies of BDNF in ADHD. A total of 102 drug-naive ADHD children (8.72.1 yr) were treated with osmotic release oral system-methylphenidate (OROS-MPH) for 12 wk, and four kinds of response criteria were applied, based first, on a combined threshold of the ADHD Rating Scale - IV (ARS) and the Clinical Global Impression - Improvement scale (CGI-I); second, on scores of 1 or 2 vs. 3-7 on the CGI - Severity scale; third, on a >50% reduction in ARS scores; and fourth, on satisfaction of all of the aforementioned criteria. The Val 66Met polymorphism of BDNF and six single nucleotide polymorphisms from the SLC6A2, ADRA2A and NTF-3 genes were tested for association with each criterion. Relative to other genotypes, homozygosity for the Val allele of the BDNF Val66Met polymorphism was associated with a greater relative frequency of good response under all four response criteria (after controlling for baseline ARS score, age, gender, final dose (mg/kg) of OROS-MPH at 12 wk, and level of academic functioning). This association was significant at the uncorrected level for the first and third response criteria ($p=0.013$ and $p=0.018$, respectively) and significant at a Bonferroni-corrected level for the second and fourth response criteria ($p=0.0002$, $p=0.0003$, respectively). Our findings support an association between homozygosity for the Val

allele of BDNF and better response to OROS-MPH in Korean ADHD children as assessed by four different response criteria.

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Int J Neuropsychopharmacol. 2011;14:1367-76.

STUDY ON THE POSSIBLE ASSOCIATION OF BRAIN-DERIVED NEUROTROPHIC FACTOR POLYMORPHISM WITH THE DEVELOPMENTAL COURSE OF SYMPTOMS OF ATTENTION DEFICIT AND HYPERACTIVITY.

Bergman O, Westberg L, Lichtenstein P, et al.

Several studies have, with conflicting results, investigated the relationship between the Val66Met polymorphism in brain-derived neurotrophic factor (BDNF) and attention deficit hyperactivity disorder (ADHD). We assessed longitudinal, quantitative phenotypes of hyperactivity-impulsivity and inattention in order to determine whether the Val66Met polymorphism is associated with age-specific and/or persistent symptoms of hyperactivity-impulsivity and/or inattention in a community-based cohort of 1236 Swedish individuals for which ADHD symptom data were collected when the participants were aged 8-9, 13-14 and 16-17 yr. The Met allele was associated with symptoms of ADHD at ages 8-9 and 13-14 yr. A multivariate regression analysis revealed that the observed effect of the Met allele on ADHD symptoms reflects an influence on persistent hyperactivity-impulsivity symptoms. The present findings support the hypothesis that BDNF is involved in the pathogenesis of ADHD. The results highlight the importance of distinguishing between hyperactivity-impulsivity and inattention, respectively, and demonstrate the value of using a longitudinal approach in genetic studies of ADHD symptoms.

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Int J Technol Assess Health Care. 2011;27:215-23.

METHYLPHENIDATE DELIVERY MECHANISMS FOR THE TREATMENT OF CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER: HETEROGENEITY IN PARENT PREFERENCES.

Lloyd A, Hodgkins P, Dewilde S, et al.

Objectives: Extended-release therapies avoid the need for children with attention-deficit/hyperactivity disorder (ADHD) to take medication at school. Recently a transdermal delivery system has been developed which can allow symptom control all day long but with greater dosing flexibility. This study explored the parents' preferences regarding oral and transdermal therapy.

Methods: A nonsystematic and qualitative literature review and in-depth interviews with parents and physicians helped identify salient treatment attributes for a discrete choice experiment. Treatment attributes included mode of administration (tablet or transdermal), speed of onset (30-90 min); duration (lasts until 3-9 pm) and ability to tailor the drug to different needs (no flexibility, limited flexibility, easy to adjust to different days). A convenience sample of parents of children treated for ADHD (n = 200) were recruited using a recruitment agency. Data were analyzed using generalized estimating equations (GEE).

Results: Parents' preferred once-a-day oral therapy (odds ratio [OR] = 1.76 [95 percent confidence interval {CI}, 1.43 - 2.18]); rapid speed of onset (OR = 1.22 [95 percent CI, 1.07 - 1.39]), and symptom control until 9 pm (OR = 3.79 [95 percent CI, 2.98 - 4.82]). Analyses identified that 30 percent of parents preferred transdermal treatment and this subgroup preferred treatments with a fast onset of action.

Conclusions: This survey demonstrates that parents of ADHD children have different preferences for the ADHD treatments prescribed for their children. A distinct subgroup of parents prefer the transdermal therapy. These parents were less likely to be working and so monitoring compliance and doing after school activities may have been easier.

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J Altern Complement Med. 2011;17:901-08.

THE EFFECT OF THERAPEUTIC HORSEBACK RIDING ON 5 CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER: A PILOT STUDY.

Cuypers K, De Ridder K, Strandheim A.

Objectives: The aim of this pilot study was to investigate the effects of therapeutic horseback riding on behavior, health-related quality of life, and motor performance in children with attention deficit hyperactivity disorder (ADHD).

Design: The study employed a time series quasi-experimental design with two pretests and two post-tests conducted 8 weeks apart.

Setting/location: The study was conducted at a riding school in Levanger, Norway.

Subjects: The subjects comprised a convenience sample of 5 children aged 10-11 years with ADHD.

Methods: Subjects received a 1-hour therapeutic horseback riding twice a week for 8 weeks as intervention.

Outcome measures: Behavior and health-related quality of life was assessed using Strength and Difficulties Questionnaire (SDQ) and The KINDLR-Health-Related Quality of Life Questionnaire, respectively. The Modified Function-Neurological Assessment and the Movement Assessment Battery for Children assessed the subject's motor performance.

Results: The pre- and post-tests scores were compared with the Wilcoxon paired sample tests and the Friedman test for nonparametric multiple test samples. Positive differences ($p(\text{less-than or equal to})0.05$) between the test results at pretest 2 and post-test 1 were noted for the behavior SDQ subscore "Total difficulties" reported by children (12.8(plus or minus)5.8), by parents (16.6(plus or minus)8.2), and by teachers (15.0(plus or minus)5.2). A significant difference ($p<0.05$) for the "Total difficulties" in SDQ was found between all 4 tests. In relation to quality of life, significant differences in the "Total score" (67.2(plus or minus)14.7) were reported by the children themselves. The motor performance improved after the intervention. The effect sizes and power were established.

Conclusions: The results of the present study indicate that therapeutic horseback riding had a positive effect on 5 children with ADHD in several domains of the social role behavior, quality of life, and motor performance. This pilot study constitutes a good scientific prospect for future studies.

Journal of Attention Disorders. 2011 Oct;15:572-82.

RESPONSE-TIME VARIABILITY IS RELATED TO PARENT RATINGS OF INATTENTION, HYPERACTIVITY, AND EXECUTIVE FUNCTION.

Gómez-Guerrero L, Martín CD, Mairena MA, et al.

Objective: Individuals with ADHD are often characterized as inconsistent across many contexts. ADHD is also associated with deficits in executive function. We examined the relationships between response time (RT) variability on five brief computer tasks to parents' ratings of ADHD-related features and executive function in a group of children with a broad range of ADHD symptoms from none to full diagnosis.

Methods: We tested 98 children (mean age 9.9 ± 1.4 years; 66 boys) from community clinics on short tasks of executive control (TEC) and the Eriksen Flanker task, while a parent completed the Conners' Parent Rating Scale and Behavior Rating Inventory of Executive Function.

Results: Variability for two of the TEC tasks explained significant proportions of the variance of all five ADHD-related Conners' subscales and several executive function subscales. By contrast, variability on the flanker task or mean RTs for any task were not associated with any rating scale.

Conclusion: The significant dimensional relationships observed between variability measures and parent ratings supported the utility of RT variability as an objective measure in ADHD and aspects of executive functioning that is superior to RT means or accuracy measures.

Journal of Attention Disorders. 2011 Oct;15:604-10.

PREDICTORS OF POSTURAL STABILITY IN CHILDREN WITH ADHD.

Ghanizadeh A.

Objective: As children with ADHD who have more inattention problems are more frequently with fine motor problems, it is not clear whether postural balance problems are associated with different subtypes of ADHD. This study investigates the predictors of postural stability in children with ADHD considering the covariant factors of age, gender, and comorbidities.

Method: A total of 103 children with ADHD are studied using Poor Postural Stability Questionnaire filled out by their parents.

Results: Linear regression analysis indicates that only oppositional-defiant behavior score is the predictor of seeking-movement subscale score. ADHD type does not predict the score of avoiding-postural-instability subscale, whereas separation anxiety score did so.

Conclusion: ADHD subtypes do not have distinct clinical profiles of the balance problems. Postural stability in children with ADHD depends on the comorbid psychiatric disorders rather than ADHD subtypes.

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Journal of Attention Disorders. 2011 Oct;15:545-56.

NOT ALWAYS HYPERACTIVE? ELEVATED APATHY SCORES IN ADOLESCENTS AND ADULTS WITH ADHD.

Torrente F, Lischinsky A, Torralva T, et al.

Objectives: To investigate the presence of apathy symptoms in adolescents and adults with ADHD as a behavioral manifestation of underlying motivational deficits and to determine whether apathy symptoms were associated with a specific neuropsychological profile.

Method: A total of 38 ADHD participants (28 of the combined subtype [ADHD/C] and 10 of the inattentive subtype [ADHD/I]) and 30 healthy controls (Ctrl) were assessed on two measures of apathy administered to subjects and informants. As well, ADHD participants completed a comprehensive neuropsychological battery.

Results: ADHD participants presented elevated scores on measures of apathy relative to controls (ADHD/I > ADHD/C > Ctrl). Informant-based ratings of apathy correlated significantly with behavioral measures of inattention. Apathy measures correlated significantly with executive tests, working memory, verbal fluency, and general intellectual abilities, only in the inattentive sample.

Conclusions: This study stresses the relevance of motivational deficits in adult ADHD as a significant clinical dimension closely linked to inattention and executive difficulties.

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Journal of Attention Disorders. 2011 Oct;15:583-92.

SELF-REGULATION OF EMOTION, FUNCTIONAL IMPAIRMENT, AND COMORBIDITY AMONG CHILDREN WITH AD/HD.

Anastopoulos AD, Smith TF, Garrett ME, et al.

Objective: This study investigated the role of self-regulation of emotion in relation to functional impairment and comorbidity among children with and without AD/HD.

Method: A total of 358 probands and their siblings participated in the study, with 74% of the sample participants affected by AD/HD. Parent-rated levels of emotional lability served as a marker for self-regulation of emotion.

Results: Nearly half of the children affected by AD/HD displayed significantly elevated levels of emotional lability versus 15% of those without this disorder. Children with AD/HD also displayed significantly higher rates of functional impairment, comorbidity, and treatment service utilization. Emotional lability partially mediated the association between AD/HD status and these outcomes.

Conclusion: Findings lent support to the notion that deficits in the self-regulation of emotion are evident in a substantial number of children with AD/HD and that these deficits play an important role in determining functional impairment and comorbidity outcomes.

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Journal of Attention Disorders. 2011 Oct;15:564-71.

COMORBIDITY OF ASTHMA WITH ADHD.

Fasmer OB, Riise T, Eagan TM, et al.

Objective: To assess how frequently drugs used to treat asthma and ADHD are prescribed to the same patients.

Method: The authors used data from the Norwegian Prescription Database for 2006, including the total Norwegian population (n = 4,640,219).

Results: Anti-asthma drugs were prescribed to 350,894 persons (7.56 % of the population), anti-ADHD drugs to 18,481 persons (0.40 %), and both to 1,730 persons. There was a 65% increased overall risk (OR = 1.65) of being prescribed one of the drugs given a prescription of the other. Women had a markedly higher risk than men. When data for each age group (10 years interval) and each gender were analyzed separately, the strongest associations were found for women between 20 and 49 years of age and men between 30 and 49 years of age.

Conclusion: These prescription patterns suggested a marked comorbidity between asthma and ADHD.

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Journal of Attention Disorders. 2011 Oct;15:593-603.

ADVERSE EFFECTS OF HEAVY PRENATAL MATERNAL SMOKING ON ATTENTIONAL CONTROL IN CHILDREN WITH ADHD.

Motlagh MG, Sukhodolsky DG, Landeros-Weisenberger A, et al.

Objective: Exposure to heavy maternal cigarette smoking in pregnancy and severe maternal psychosocial stress during pregnancy appear to be important risk factors for the development of ADHD. This study aimed to determine whether these perinatal risk factors were associated with neuropsychological deficits commonly seen in ADHD.

Method: We examined the effect of these two risk factors on measures of attentional control, motor inhibition, visual-motor integration, and fine motor coordination in a group of 81 children with ADHD, aged from 8 to 18 years. The neuropsychological battery included the Connors' Continuous Performance Test (CPT), the Stroop Color-Word Interference Test, the Beery Visual-Motor Integration Test, and the Purdue Pegboard Test.

Results: Heavy maternal smoking during pregnancy was associated with slower reaction times ($p < .002$), and reaction time variability ($p < .007$) on the CPT.

Conclusions: This study suggests a persistent negative effect of heavy prenatal maternal smoking on attentional control in children with ADHD. Future studies should examine the neurobiological basis and determine the degree to which inherited genetic susceptibility factors contribute to this finding.

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J Autism Dev Disord. 2011 Sep;41:1147-56.

IDENTIFICATION OF AUTISM SPECTRUM DISORDERS USING THE CHILD BEHAVIOR CHECKLIST IN SINGAPORE.

Ooi YP, Rescorla L, Ang RP, et al.

We tested the ability of the 2001 CBCL syndromes to discriminate among 86 children with Autism Spectrum Disorder (ASD), 117 children with Attention Deficit Hyperactivity Disorder—Inattentive type, 426 children with Attention Deficit Hyperactivity Disorder—Hyperactive-Impulsive or Combined type, 200 clinically referred children who did not receive a diagnosis, and 436 typically-developing children in a community sample. The Withdrawn/Depressed, Social Problems, and Thought Problems syndromes significantly discriminated the ASD group from the four other groups. An ASD scale, constructed from nine CBCL items, demonstrated moderate to high sensitivity (68 to 78%) and specificity (73 to 92%). Consistent with previous research, findings from this study provide strong support for the CBCL as a screening tool for ASD.

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J Autism Dev Disord. 2011 Sep;41:1178-91.

EXAMINING AUTISTIC TRAITS IN CHILDREN WITH ADHD: DOES THE AUTISM SPECTRUM EXTEND TO ADHD?

Grzadzinski R, Di Martino A, Brady E, et al.

We examined to what extent increased parent reports of autistic traits in some children with Attention Deficit Hyperactivity Disorder (ADHD) are the result of ADHD-related symptoms or qualitatively similar to the core characteristics of autism spectrum disorders (ASD). Results confirm the presence of a subgroup of children with ADHD and elevated ratings of core ASD traits (ADHD⁺) not accounted for by ADHD or behavioral symptoms. Further, analyses revealed greater oppositional behaviors, but not greater ADHD severity or anxiety, in the ADHD⁺ subgroup compared to those with ADHD only. These results highlight the importance of specifically examining autistic traits in children with ADHD for better characterization in studies of the underlying psychopathology and treatment.

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Journal of Child & Adolescent Substance Abuse. 2011 Sep;20:314-29.

A PROSPECTIVE EXAMINATION OF THE ASSOCIATION OF STIMULANT MEDICATION HISTORY AND DRUG USE OUTCOMES AMONG COMMUNITY SAMPLES OF ADHD YOUTHS.

Winters K, Lee S, Botzet A, et al.

A continuing debate in the child psychopathology literature is the extent to which pharmacotherapy for children with attention-deficit/hyperactivity disorder (ADHD), in particular stimulant treatment, confers a risk of subsequent drug abuse. If stimulant treatment for ADHD contributes to drug abuse, then the risk versus therapeutic benefits of such treatment is greatly affected. We have prospectively followed an ADHD sample (N = 149; 81% males) for approximately 15 years, beginning at childhood (ages 8 to 10 years) and continuing until the sample has reached young adulthood (ages 22 to 24 years). The sample was originally recruited via an epidemiologically derived community procedure, and all youths were diagnosed with ADHD during childhood. We report on the association of childhood psychostimulant medication and subsequent substance use disorders and tobacco use. The substance use outcomes were based on data collected at three time points when the sample was in late adolescence and young adulthood (age range approximately 18 to 22 years old). We did not find evidence to support that childhood treatment with stimulant medication, including the course of stimulant medication, was associated with any change in risk for adolescent or young adulthood substance use disorders and tobacco use. These results from a community-based sample extend the growing body of literature based on clinically derived samples indicating that stimulant treatment does not create a significant risk for subsequent substance use disorders.

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J Child Adolesc Psychopharmacol. 2011;21:389-97.

WHEN PARENT AND TEACHER RATINGS DON'T AGREE: THE TRACKING ADOLESCENTS' INDIVIDUAL LIVES SURVEY (TRAILS).

Rettew DC, Van Oort FVA, Verhulst FC, et al.

Objectives: A commonly encountered situation for evaluating clinicians is a history of significant problems in one setting with little or no difficulties in another. This study aims to describe this phenomenon and to examine its relations with other child and family characteristics.

Method: A total of 1,730 children (mean age 11.05 years) was studied from the first wave of the Tracking Adolescents' Individual Lives Survey (TRAILS), a large population-based study of Dutch youth. Parent and teacher ratings of aggression, rule breaking, inattention, and hyperactivity were obtained. Children were assigned to groups according to the presence of clinically relevant problems at home only, at school only, or in both settings. The rate of setting specific problems was calculated and comparisons between groups were made.

Results: Setting specific, especially home-specific, problems were quite common. Among children whom parents rated as having at least borderline-clinical problems, teachers reported clear or very clear behaviors at school at the following rates: aggression (22%), rule breaking (12.5%), inattention (55%), and hyperactivity/impulsivity (33%). Compared with the school-specific group, the home-specific group contained a significantly higher percentage of girls with regard to inattention or hyperactivity and a

significantly lower percentage of girls with regards to rule breaking. Logistic regression analyses revealed that home- versus school-specific problems were related to sex, child effortful control, and parental stress.

Conclusion: Externalizing problems are frequently encountered only in one setting between home and school and are related to sex, child effortful control, and parental stress.

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J Child Adolesc Psychopharmacol. 2011;21:445-54.

COMPARISON OF THE EFFICACY OF TWO DIFFERENT MODIFIED RELEASE METHYLPHENIDATE PREPARATIONS FOR CHILDREN AND ADOLESCENTS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER IN A NATURAL SETTING: COMPARISON OF THE EFFICACY OF MEDIKINET(REGISTERED TRADEMARK) RETARD AND CONCERTA(REGISTERED TRADEMARK)-A RANDOMIZED, CONTROLLED, DOUBLE-BLIND MULTICENTER CLINICAL CROSSOVER TRIAL.

Dopfner M, Ose C, Fischer R, et al.

Objective: The comparison of the efficacy of Medikinet (registered trademark) retard and Concerta (registered trademark) trial was a multisite, randomized, double-blind, crossover trial that aimed at comparing the effects of two different modified release methylphenidate preparations (Medikinet retard: 50% immediate release (IR); Concerta: 22% IR) in a natural setting across the day in 113 randomized children and adolescents with attention-deficit/hyperactivity disorder (age range 6-16 years). The duration of the study per patient was 3 weeks.

Methods: The primary outcome variable was the German version of the "Swanson, Kotkin, Agler, M-Flynn, and Pelham scale" in the first 3 hours of school as assessed by teachers.

Results: Medikinet retard with a higher IR component than Concerta (and an equivalent daily dose) was superior to Concerta ($p=0.0009$), and Medikinet retard with similar IR components in the morning as Concerta (but a lower daily dose) was noninferior to Concerta with regard to the primary outcome. Further, exploratory analyses on teacher and parent ratings on attention-deficit/hyperactivity disorder and on externalizing symptoms during the day revealed no evidence for the superiority of Concerta over Medikinet retard in an equivalent daily dosage throughout the day.

Conclusion: Children and adolescents may be treated with a lower daily dose of Medikinet retard (which has a similar IR component as Concerta) without resulting in a clinically relevant worse effect during school time.

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J Child Adolesc Psychopharmacol. 2011;21:465-68.

IMPULSIVITY IN ADOLESCENTS WITH BIPOLAR DISORDER AND/OR ATTENTION-DEFICIT/HYPERACTIVITY DISORDER AND HEALTHY CONTROLS AS MEASURED BY THE BARRATT IMPULSIVENESS SCALE.

Nandagopal JJ, Fleck DE, Adler CM, et al.

Objective: To compare the type and degree of impulsivity among adolescents with bipolar disorder (BD), adolescents with attention-deficit/hyperactivity disorder (ADHD), and healthy comparison subjects using the Barratt Impulsiveness Scale, Version 11 (BIS-11).

Methods: Manic adolescents with BD ($n=31$), adolescents with ADHD ($n=30$), and healthy subjects ($n=25$) completed the BIS-11, a 30-item, self-report scale with three subscales (cognitive, motor, and nonplanning). The BIS-11 total and subscale scores were compared among groups. We also examined associations among the BIS-11, Young Mania Rating Scale and co-occurring disruptive behavioral disorders (DBDs) within the BD group.

Results: Total and each subscale scores were significantly higher for the BD group than for the healthy controls ($p<0.05$). The total scores and the cognitive and motor subscale scores were significantly higher for the ADHD group than for the healthy control group ($p<0.05$). However, there was no statistically significant difference between the nonplanning subscale scores of the ADHD group and the healthy control group ($p>0.05$). There were no significant differences between the BD and ADHD groups or between the BD groups with and without ADHD. The BD patients with DBDs (i.e., oppositional defiant disorder or conduct disorder) scored significantly higher on the motor subscale than did BD patients without DBDs. There were no statistically significant associations between the Young Mania Rating Scale and BIS-11 scores within the BD group.

Conclusion: Our findings suggest that impulsivity is elevated in adolescents with BD as well as adolescents with ADHD, except for nonplanning impulsivity, which was not significantly different between adolescents with ADHD and the healthy comparison group. This may suggest that nonplanning impulsivity is relatively specific to adolescents with BD. Additionally, our data indicate that elevations in impulsivity, as measured by the BIS-11, may be independent of symptoms severity and, therefore, may be a stable, trait-related component of BD.

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J Child Adolesc Psychopharmacol. 2011;21:433-44.

NEUROPSYCHOLOGICAL OUTCOMES ACROSS THE DAY IN CHILDREN WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER TREATED WITH ATOMOXETINE: RESULTS FROM A PLACEBO-CONTROLLED STUDY USING A COMPUTER-BASED CONTINUOUS PERFORMANCE TEST COMBINED WITH AN INFRA-RED MOTION-TRACKING DEVICE.

Wehmeier PM, Schacht A, Wolff C, et al.

The effect of atomoxetine (ATX) on executive function has been assessed by means of questionnaires only. The aim of this study was therefore to evaluate the efficacy of ATX using standard variables of a computer-based continuous performance test (cb-CPT) combined with an infra-red motion-tracking device at different times of the day. One hundred twenty-eight girls and boys aged 6 to 12 years with a diagnosis of ADHD according to DSM-IV-TR criteria were randomized in the study. The primary efficacy measures were the q-scores of the cb-CPT combined with an infra-red motion-tracking device. The test comprises 13 neuropsychological variables that can be taken to reflect hyperactivity, inattention, or impulsivity. One hundred five patients completed the study (ATX group: n=54; placebo group: n=51). ATX (target dose 1.2 mg/kg/day) over 8 weeks was significantly superior to placebo in reducing hyperactivity, inattention, and impulsivity as measured by q-scores of 10 primary variables of the cb-CPT. Both groups of patients showed a circadian pattern of neuropsychological outcomes across the day as reflected by the cb-CPT combined with an infra-red motion-tracking device. In summary, this study demonstrated a positive effect of ATX on some aspects of executive function, inhibitory control, and hyperactivity compared with placebo.

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J Child Adolesc Psychopharmacol. 2011;21:455-63.

SUBJECTIVE EFFECTS, MISUSE, AND ADVERSE EFFECTS OF OSMOTIC-RELEASE METHYLPHENIDATE TREATMENT IN ADOLESCENT SUBSTANCE ABUSERS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER.

Winhusen TM, Lewis DF, Riggs PD, et al.

Objective: Psychostimulants are effective treatments for attention-deficit/hyperactivity disorder (ADHD) but may be associated with euphoric effects, misuse/diversion, and adverse effects. These risks are perceived by some clinicians to be greater in substance-abusing adolescents relative to non-substance-abusing adults. The present study evaluates the subjective effects, misuse/diversion, and adverse effects associated with the use of osmotic-release oral system methylphenidate (OROS-MPH), relative to placebo, for treating ADHD in adolescents with a substance use disorder (SUD) as a function of substance use severity and compared these risks with those associated with the treatment of ADHD in adults without a non-nicotine SUD.

Method: Datasets from two randomized placebo-controlled trials of OROS-MPH for treating ADHD, one conducted with 303 adolescents (13-18) with at least one non-nicotine SUD and one with 255 adult smokers (18-55), were analyzed. Outcome measures included the Massachusetts General Hospital Liking Scale, self-reported medication compliance, pill counts, and adverse events (AEs).

Results: Euphoric effects and misuse/diversion of OROS-MPH were not significantly affected by substance use severity. The euphoric effects of OROS-MPH did not significantly differ between the adolescent and adult samples. Adults rated OROS-MPH as more effective in treating ADHD, whereas adolescents reported feeling more depressed when taking OROS-MPH. The adolescents lost more pills relative to the adults regardless of treatment condition, which suggests the importance of careful medication monitoring. Higher baseline use of alcohol and cannabis was associated with an increased risk of experiencing a treatment-related AE in OROS-MPH, but baseline use did not increase the risk of serious AEs or of any particular category of AE and the adolescents did not experience more treatment-related AEs relative to the adults.

Conclusions: With good monitoring, and in the context of substance abuse treatment, OROS-MPH can be safely used in adolescents with an SUD despite non-abstinence.

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J Child Adolesc Psychopharmacol. 2011;21:495-98.

METHYLPHENIDATE TRANSDERMAL SYSTEM IN PRESCHOOL CHILDREN WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER.

Ghuman JK, Byreddy S, Ghuman HS.

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Journal of Child Psychology and Psychiatry. 2011 Oct;52:1035-43.

INVESTIGATION OF COOL AND HOT EXECUTIVE FUNCTION IN ODD/CD INDEPENDENTLY OF ADHD.

Hobson CW, Scott S, Rubia K.

Background: Children with oppositional defiant disorder/conduct disorder (ODD/CD) have shown deficits in 'cool' abstract-cognitive, and 'hot' reward-related executive function (EF) tasks. However, it is currently unclear to what extent ODD/CD is associated with neuropsychological deficits, independently of attention deficit hyperactivity disorder (ADHD).

Methods: Fifty-nine adolescents with a history of early-onset oppositional problems, 28 with pure ODD/CD symptoms and 31 with ADHD with or without ODD/CD, and 34 healthy controls were administered a task battery measuring motor response inhibition, sustained attention, cognitive flexibility and reward-related decision-making. Findings were analysed using dimensional and group analyses.

Results: In group analyses both groups with and without ADHD were impaired in EF measures. Dimensional analyses, however, showed that ODD/CD but not ADHD was related to hot EF based on increased risky decision-making in the Iowa Gambling Task. ODD/CD was also independently related to aspects of cool EF independently of ADHD, namely slower speeds of inhibitory responding and increased intra-subject variability.

Conclusions: These findings show EF deficits associated with ODD/CD independently of ADHD, and implicate reward-related abnormalities in theories of antisocial behaviour development.

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Journal of Child Psychology and Psychiatry. 2011 Sep;52:933-41.

FACTORS ASSOCIATED WITH ACCEPTANCE OF PEERS WITH MENTAL HEALTH PROBLEMS IN CHILDHOOD AND ADOLESCENCE.

Swords L, Heary C, Hennessy E.

Background: Research suggests that children's reactions to peers with mental health problems are related to the maintenance and outcomes of these problems. However, children's perceptions of such peers, particularly those with internalising problems, are neither well researched nor understood. The present study aimed to test a series of models relating socio-demographic and attributional variables to the acceptance of hypothetical boys and girls with attention deficit hyperactivity disorder (ADHD) and depression.

Methods: A sample of 595 participants, drawn from five different age-groups spanning early childhood to late adolescence, completed a booklet of questions in response to two vignettes describing the behaviour of hypothetical target peers with depression and ADHD. The sample was drawn from schools randomly selected in the east of Ireland.

Results: The models indicated that age and gender of the participant, and the perceived responsibility of the target character for his/her condition, were the three most important predictors of acceptance in all models. However, the relationship between these variables and acceptance varied depending on the gender of the target child and the condition (depression or ADHD) in the models tested.

Conclusions: The findings of the study suggest that the relationships between socio-demographic and attributional variables and acceptance of peers with mental health problems depend on the type of mental

health problem under consideration. The findings have implications for the development of information and education programmes to improve the integration of children with mental health problems.

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Journal of Child Psychology and Psychiatry. 2011 Sep;52:954-63.

DEVELOPMENTAL TRAJECTORIES OF DSM-IV SYMPTOMS OF ATTENTION-DEFICIT/HYPERACTIVITY DISORDER: GENETIC EFFECTS, FAMILY RISK AND ASSOCIATED PSYCHOPATHOLOGY.

Larsson H, Dilshad R, Lichtenstein P, et al.

Background: DSM-IV specifies three ADHD subtypes; the combined, the hyperactive-impulsive and the inattentive. Little is known about the developmental relationships underlying these subtypes. The objective of this study was to describe the development of parent-reported hyperactivity-impulsivity and inattention symptoms from childhood to adolescence and to study their associations with genetic factors, family risk, and later adjustment problems in early adulthood.

Method: Data in this study comes from 1,450 twin pairs participating in a population-based, longitudinal twin study. Developmental trajectories were defined using parent-ratings of hyperactivity-impulsivity and inattention symptoms at age 8–9, 13–14, and 16–17. Twin methods were used to explore genetic influences on trajectories. Family risk measures included low socioeconomic status, large family size and divorce. Self-ratings of externalizing and internalizing problems in early adulthood were used to examine adjustment problems related to the different trajectory combinations.

Results: We found two hyperactivity-impulsivity trajectories (low, high/decreasing) and two inattention trajectories (low, high/increasing). Twin modeling revealed a substantial genetic component underlying both the hyperactivity-impulsivity and the inattention trajectory. Joint trajectory analyses identified four groups of adolescents with distinct developmental patterns of hyperactivity-impulsivity and inattention: a low/low group, a primarily hyperactive, a primarily inattentive and a combined (high/high) trajectory type. These trajectory combinations showed discriminant relations to adjustment problems in early adulthood. The hyperactive, inattentive and combined trajectory subtypes were associated with higher rates of family risk environments compared to the low/low group.

Conclusion: Study results showed that for those on a high trajectory, hyperactivity decreased whereas inattention increased. The combinations of these trajectories lend developmental insight into how children shift from (i) a combined to inattentive subtype, and (ii) a hyperactive-impulsive to a combined subtype. This study suggests that ADHD subtypes cannot be viewed as discrete and stable categories.

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Journal of Child Psychology and Psychiatry. 2011 Nov;52:1164-73.

COMMON ALTERATIONS IN SENSITIVITY TO TYPE BUT NOT AMOUNT OF REWARD IN ADHD AND AUTISM SPECTRUM DISORDERS.

Demurie E, Roeyers H, Baeyens D, et al.

Background: Children with attention deficit/hyperactivity disorder (ADHD) display abnormalities in reward processing. Most reward studies have focused on the effects of material or monetary rewards. Studies with autism spectrum disorder (ASD) have focused on social rewards. In this study we compared the effects of amount and type of reward in children with ADHD and those with ASD.

Methods: Two adapted versions of the Monetary Incentive Delay Task were used to study the effects of monetary and social reward anticipation on performance in 40 typically developing (TD) children and adolescents (8–16y), 35 children and adolescents with ADHD and 31 children and adolescents with ASD.

Results: Monetary and social reward improved accuracy and response time (RT) in all groups. The higher the anticipated reward, the more accurate and faster were responses. Independent of these effects, there was a differential effect of reward type. Both clinical groups, but not TD, responded faster for monetary than social rewards.

Conclusions: The results, while not supporting hyposensitivity to changes in reward amount in ADHD and ASD, do suggest that both groups are generally less motivated in settings where social as opposed to monetary rewards can be earned.

Journal of Child Psychology and Psychiatry. 2011 Sep;52:942-53.

ERPS ASSOCIATED WITH MONITORING AND EVALUATION OF MONETARY REWARD AND PUNISHMENT IN CHILDREN WITH ADHD.

Van Meel CS, Heslenfeld DJ, Oosterlaan J, et al.

Background: Several models of attention-deficit hyperactivity disorder (ADHD) propose abnormalities in the response to behavioural contingencies. Using event-related potentials (ERPs), the present study investigated the monitoring and subsequent evaluation of performance feedback resulting in either reward or punishment in children with ADHD (N = 18) and normal controls (N = 18) aged 8 to 12 years.

Methods: Children performed a time production task, in which visual performance feedback was given after each response. To manipulate its motivational salience, feedback was coupled with monetary gains, losses or no incentives.

Results: Performance feedback signalling omitted gains as well as omitted losses evoked a feedback-related negativity (FRN) in control children. The FRN, however, was entirely absent in children with ADHD in all conditions. Moreover, while losses elicited enhanced amplitudes of the late positive potential (LPP) in controls, omitted rewards had this effect in ADHD.

Conclusions: The lack of modulation of the FRN by contingencies in ADHD suggests deficient detection of environmental cues as a function of their motivational significance. LPP findings suggest diminished response to punishment, but oversensitivity to the loss of desired rewards. These findings suggest that children with ADHD have problems assigning relative motivational significance to outcomes of their actions.

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Journal of Clinical Child and Adolescent Psychology. 2011 Sep;40:777-86.

GENDER AND CONDUCT PROBLEMS PREDICT PEER FUNCTIONING AMONG CHILDREN WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER.

Mikami AY, Lorenzi J.

Children with attention-deficit-hyperactivity disorder (ADHD) often have poor relationships with peers. However, research on this topic has predominantly focused on boys. This study considered child gender, ADHD status, and dimensionally assessed conduct problems as predictors of peer relationship difficulties. Participants were 125 children (ages 6–10; 67% male), 63 with clinical diagnoses of ADHD and 62 non-ADHD comparison youth. Conduct problems were reported by teachers and observed in a lab playgroup. Peer relationships were assessed by parent report, teacher report, and peer sociometric nominations in the playgroup. Results suggested that children with ADHD, as well as those with high conduct problems, displayed more impaired peer relationships than did comparison children and those with low conduct problems, but overall there were no gender differences in social functioning. However, statistical interactions appeared such that the negative impact of conduct problems on peer relationships was stronger for girls than for boys.

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J Clin Outcomes Manage. 2011;18:526-36.

COGNITIVE BEHAVIORAL THERAPY FOR ADULT ADHD.

Ramsay JR.

(bullet) **Objective:** To review principles of cognitive behavioral therapy (CBT) as a psychosocial treatment for adult patients diagnosed with attention-deficit/hyperactivity disorder (ADHD).

(bullet) **Methods:** Case presentation and review of the literature.

(bullet) **Results:** Although previously thought to be a neurodevelopmental syndrome exclusive to childhood, it is now recognized that the majority of individuals diagnosed with ADHD will continue to encounter ongoing symptoms in adulthood. These symptoms may be subthreshold but continue to cause significant coping difficulties or, in many cases, may reflect full syndromic persistence. Moreover, many individuals with ADHD are not identified until encountering problems in adulthood. A lifetime diagnosis of ADHD is associated with increased risk for impairments in most domains of adult life. Although the deficits of "attention" and "hyperactivity" are considered characteristic of ADHD, it has come to be known as a disorder of poor self-regulation such that individuals have difficulty developing and executing plans across

time for which there are long-range benefits but that are not immediately reinforcing. Pharmacotherapy is the most effective single treatment for reducing the core symptoms of ADHD, though medications do not necessarily produce sufficient functional improvements in daily life for many patients. Hence, CBT has been adapted to help individuals develop and implement coping strategies with which to manage the effects of ADHD. Behavioral modification and implementation of strategies are emphasized, though cognitive modification of negative thoughts and self-assessments is an important element of treatment.

(bullet) **Conclusion:** CBT, adapted to address the needs of adults diagnosed with ADHD, has emerged as the evidence-supported adjunctive treatment of choice for patients for whom medication treatment alone is not associated with adequate symptomatic and functional improvements.

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J Paediatr Child Health. 2011.

PRACTITIONER CHARACTERISTICS AND THE TREATMENT OF CHILDREN AND ADOLESCENTS WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER.

Mitchell PB, Levy F, Hadzi-Pavlovic D, et al.

Aim: To investigate whether recent Australian practice conforms to the draft 2009 National Health and Medical Research Council (NHMRC) guidelines on the management of attention deficit hyperactivity disorder.

Methods: Data from the 2007 Special Review on Attention Deficit Hyperactivity Disorder in Children and Adolescents in New South Wales (NSW) were examined.

Results: Two hundred seven approved stimulant prescribers in NSW responded to a detailed survey on treatment practice (including 121 paediatricians and 67 psychiatrists). Overall, the practice identified in this survey of NSW approved stimulant prescribers was consistent with that recommended in the draft NHMRC guidelines. Paediatricians were more likely to inform families of developmental therapies. Most prescribers (67%) considered stimulants to be the first line of treatment for at least half of their patients. Psychiatrists were more likely to use stimulants as first-line treatments, while those recently qualified were less likely to prescribe. Half of the prescribers were willing to consider prescribing for children 4 years of age and younger. Paediatricians were more likely to consider prescribing to this age group, while those recently qualified were less likely. There were no significant differences in prescribing practice between child and adult psychiatrists. Most prescribers (67-97%) routinely monitored patients on stimulants for weight, height, blood pressure and academic progress. Psychiatrists were less likely to review these parameters than paediatricians, with this difference being largely due to adult psychiatrists.

Conclusions: There are significant differences in prescribing practice between paediatricians and psychiatrists. These variations may reflect differing training programs and patient populations, and merit close consideration in any review arising from the publication of the recent NHMRC guideline.

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J Pediatr Psychol. 2011 Sep;36:902-10.

SALIVARY CORTISOL RESPONSIVITY TO AN INTRAVENOUS CATHETER INSERTION IN CHILDREN WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER.

McCarthy AM, Hanrahan K, Scott LM, et al.

Objective: To compare salivary cortisol baseline levels and responsivity as well as behavioral distress to intravenous (IV) catheter insertions in 4- to 10-year-old children with (n = 29) and without (n = 339) attention-deficit/hyperactivity disorder (ADHD).

Methods: This is a secondary data analysis from a sample of 542 children who participated in a multisite study on distraction. Data included were demographic variables, Pediatric Behavior Scale-30, Observational Scale of Behavioral Distress-Revised, and four salivary cortisol samples.

Results: Home samples from the ADHD group revealed nonsignificant but higher cortisol levels than the non-ADHD group. However, on the clinic day, the ADHD group had significantly lower cortisol levels before (0.184 vs. 0.261, p = .040) and 20–30 min after IV insertion (0.186 vs. 0.299, p = .014) compared with the non-ADHD group.

Conclusions: Cortisol levels in children with and without ADHD differ in response to the stress of an IV insertion.

J Psychiatr Res. 2011 Nov;45:1453-62.

SUBSTANCE USE DISORDERS AND COMORBID AXIS I AND II PSYCHIATRIC DISORDERS AMONG YOUNG PSYCHIATRIC PATIENTS: FINDINGS FROM A LARGE ELECTRONIC HEALTH RECORDS DATABASE.

WU LT, GERSING K, BURCHETT B, ET AL.

This study examined the prevalence of substance use disorders (SUDs) among psychiatric patients aged 2–17 years in an electronic health records database (N =11,457) and determined patterns of comorbid diagnoses among patients with a SUD to inform emerging comparative effectiveness research (CER) efforts. DSM-IV diagnoses of all inpatients and outpatients at a large university-based hospital and its associated psychiatric clinics were systematically captured between 2000 and 2010: SUD, anxiety (AD), mood (MD), conduct (CD), attention deficit/hyperactivity (ADHD), personality (PD), adjustment, eating, impulse-control, psychotic, learning, mental retardation, and relational disorders. The prevalence of SUD in the 2–12-year age group (n =6210) was 1.6% and increased to 25% in the 13–17-year age group (n =5247). Cannabis diagnosis was the most prevalent SUD, accounting for more than 80% of all SUD cases. Among patients with a SUD (n =1423), children aged 2–12 years (95%) and females (75–100%) showed high rates of comorbidities; blacks were more likely than whites to be diagnosed with CD, impulse-control, and psychotic diagnoses, while whites had elevated odds of having AD, ADHD, MD, PD, relational, and eating diagnoses. Patients with a SUD used more inpatient treatment than patients without a SUD (43% vs. 21%); children, females, and blacks had elevated odds of inpatient psychiatric treatment. Collectively, results add clinical evidence on treatment needs and diagnostic patterns for understudied diagnoses.

J Am Acad Audiol. 2011;22:501-14.

THE UTILITY OF VISUAL ANALOGS OF CENTRAL AUDITORY TESTS IN THE DIFFERENTIAL DIAGNOSIS OF (CENTRAL) AUDITORY PROCESSING DISORDER AND ATTENTION DEFICIT HYPERACTIVITY DISORDER.

Bellis TJ, Billiet C, Ross J.

Background: Cacace and McFarland (2005) have suggested that the addition of cross-modal analogs will improve the diagnostic specificity of (C)APD (central auditory processing disorder) by ensuring that deficits observed are due to the auditory nature of the stimulus and not to supra-modal or other confounds. Others (e.g., Musiek et al., 2005) have expressed concern about the use of such analogs in diagnosing (C)APD given the uncertainty as to the degree to which cross-modal measures truly are analogous and emphasize the nonmodularity of the CANs (central auditory nervous system) and its function, which precludes modality specificity of (C)APD. To date, no studies have examined the clinical utility of cross-modal (e.g., visual) analogs of central auditory tests in the differential diagnosis of (C)APD.

Purpose: This study investigated performance of children diagnosed with (C)APD, children diagnosed with ADHD (attention deficit hyperactivity disorder), and typically developing children on three diagnostic tests of central auditory function and their corresponding visual analogs. The study sought to determine whether deficits observed in the (C)APD group were restricted to the auditory modality and the degree to which the addition of visual analogs aids in the ability to differentiate among groups.

Research Design: An experimental repeated measures design was employed.

Study Sample: Participants consisted of three groups of right-handed children (normal control, n=10; ADHD, n=10; (C)APD, n=7) with normal and symmetrical hearing sensitivity, normal or corrected-tonormal visual acuity, and no family or personal history of disorders unrelated to their primary diagnosis. Participants in Groups 2 and 3 met current diagnostic criteria for ADHD and (C)APD.

Data Collection and Analysis: Visual analogs of three tests in common clinical use for the diagnosis of (C)APD were used (Dichotic Digits [Musiek, 1983]; Frequency Patterns [Pineiro and Ptacek, 1971]; and Duration Patterns [Pineiro and Musiek, 1985]). Participants underwent two 1 hr test sessions separated by at least 1 wk. Order of sessions (auditory, visual) and tests within each session were counterbalanced across participants. ANCOVAs (analyses of covariance) were used to examine effects of group, modality,

and laterality (Dichotic/Dichoptic Digits) or response condition (auditory and visual patterning). In addition, planned univariate ANCOVAs were used to examine effects of group on intratest comparison measures (REA, HLD [Humming-Labeling Differential]).

Results: Children with both ADHD and (C)APD performed more poorly overall than typically developing children on all tasks, with the (C)APD group exhibiting the poorest performance on the auditory and visual patterns tests but the ADHD and (C)APD group performing similarly on the Dichotic/Dichoptic Digits task. However, each of the auditory and visual intratest comparison measures, when taken individually, was able to distinguish the (C)APD group from both the normal control and ADHD groups, whose performance did not differ from one another.

Conclusions: Results underscore the importance of intratest comparison measures in the interpretation of central auditory tests (American Speech-Language- Hearing Association [ASHA], 2005; American Academy of Audiology [AAA], 2010). Results also support the "non-modular" view of (C)APD in which cross-modal deficits would be predicted based on shared neuroanatomical substrates. Finally, this study demonstrates that auditory tests alone are sufficient to distinguish (C)APD from supra-modal disorders, with cross-modal analogs adding little if anything to the differential diagnostic process.

Journal of the American Academy of Child & Adolescent Psychiatry. 2011 Oct;50:1017-26.

PROGRESSION OF AMYGDALA VOLUMETRIC ABNORMALITIES IN ADOLESCENTS AFTER THEIR FIRST MANIC EPISODE.

Bitter SM, Mills NP, Adler CM, et al.

Objective: Although previous neuroimaging studies suggest that adolescents with bipolar disorder exhibit smaller amygdala volumes compared with healthy adolescents, whether these abnormalities are present at illness onset or instead develop over time remains unclear. The aim of this study was to conduct a prospective longitudinal investigation comparing amygdala neurodevelopment among adolescents after their first manic episode, adolescents with attention-deficit/hyperactivity disorder (ADHD), and healthy adolescents.

Method: A total of 30 adolescents hospitalized for their first manic/mixed episode associated with bipolar disorder, 29 adolescents with ADHD, and 24 demographically matched healthy teens underwent magnetic resonance imaging scanning at index assessment and approximately 12 months later. Adolescents with bipolar disorder were prospectively evaluated using diagnostic interviews and with symptom rating scales.

Results: Mixed models examining the group \times time effect for both left ($p = .005$) and right ($p = .002$) amygdala volumes were statistically significant. Change in left ($p = .01$) and right ($p = .0008$) amygdala volumes from baseline to 12 months were significantly different among groups. Specifically, left amygdala volumes increased over time in healthy adolescents ($p = .008$) and adolescents with ADHD ($p = .0009$), but not in adolescents with bipolar disorder ($p = .3$). Right amygdala volume increased over time in adolescents with ADHD ($p < .001$), but not in healthy adolescents nor in adolescents with bipolar disorder ($p = .1$ and $p = .3$, respectively). In adolescents with bipolar disorder, baseline total amygdala volume was significantly greater in those who subsequently achieved symptomatic recovery as compared with those who did not achieve recovery ($p = .02$).

Conclusions: Adolescents with mania do not exhibit normal increases in amygdala volume that occur during healthy adolescent neurodevelopment.

Journal of the American Academy of Child & Adolescent Psychiatry. 2011 Oct;50:991-1000.

OMEGA-3 FATTY ACID SUPPLEMENTATION FOR THE TREATMENT OF CHILDREN WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER SYMPTOMATOLOGY: SYSTEMATIC REVIEW AND META-ANALYSIS.

Bloch MH, Qawasmi A.

Objective: Several studies have demonstrated differences in omega-3 fatty acid composition in plasma and in erythrocyte membranes in patients with attention-deficit/hyperactivity disorder (ADHD) compared with unaffected controls. Omega-3 fatty acids have anti-inflammatory properties and can alter central nervous system cell membrane fluidity and phospholipid composition. Cell membrane fluidity can alter

serotonin and dopamine neurotransmission. The goal of this meta-analysis was to examine the efficacy of omega-3 fatty acid supplementation in children with ADHD.

Method: PubMed was searched for randomized placebo-controlled trials examining omega-3 fatty acid supplementation in children with ADHD symptomatology. The primary outcome measurement was standardized mean difference in rating scales of ADHD severity. Secondary analyses were conducted to determine the effects of dosing of different omega-3 fatty acids in supplements.

Results: Ten trials involving 699 children were included in this meta-analysis. Omega-3 fatty acid supplementation demonstrated a small but significant effect in improving ADHD symptoms. Eicosapentaenoic acid dose within supplements was significantly correlated with supplement efficacy. No evidence of publication bias or heterogeneity between trials was found.

Conclusion: Omega-3 fatty acid supplementation, particularly with higher doses of eicosapentaenoic acid, was modestly effective in the treatment of ADHD. The relative efficacy of omega-3 fatty acid supplementation was modest compared with currently available pharmacotherapies for ADHD such as psychostimulants, atomoxetine, or $\alpha 2$ agonists. However, given its relatively benign side-effect profile and evidence of modest efficacy, it may be reasonable to use omega-3 fatty supplementation to augment traditional pharmacologic interventions or for families who decline other psychopharmacologic options.

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Journal of the American Academy of Child & Adolescent Psychiatry. 2011 Oct;50:1042-53.

DISENTANGLING CHILD AND FAMILY INFLUENCES ON MATERNAL EXPRESSED EMOTION TOWARD CHILDREN WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER.

Cartwright KL, Bitsakou P, Daley D, et al.

Objective: We used multi-level modelling of sibling-pair data to disentangle the influence of proband-specific and more general family influences on maternal expressed emotion (MEE) toward children and adolescents with attention-deficit/hyperactivity disorder (ADHD).

Method: MEE was measured using the Five Minute Speech Sample (FMSS) for 60 sibling pairs (aged 5 through 17 years) each comprising one proband with ADHD and one child without ADHD. Questionnaire measures were used to assess child and adolescent conduct and emotional problems and maternal depression and ADHD. Multi-level models partitioned the effects of five MEE components (initial statement [IS], relationship [REL], warmth [WAR], critical comments [CC], and positive comments [PC]) into proband-specific and general family effects.

Results: Significant proband-specific effects were confirmed for all MEE components, with higher levels of MEE expressed toward probands with ADHD than siblings without ADHD. For REL, PC, and CC, this effect was explained by comorbid child conduct problems rather than ADHD. Only low WAR was associated with child ADHD itself. Furthermore, only low WAR was related to variations in more general family characteristics, especially levels of maternal depression.

Conclusions: MEE toward children with ADHD was influenced by proband-specific factors. For most components, these were driven by comorbid symptoms of conduct problems rather than ADHD itself. WAR was different; it was influenced by both child-specific and more general characteristics of the family. Further studies utilising a longitudinal design are required to establish the direction of causation and extend our understanding of the relationship between EE components and ADHD.

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Journal of the American Academy of Child & Adolescent Psychiatry. 2011 Sep;50:892-902.

LINKS BETWEEN CO-OCCURRING SOCIAL-COMMUNICATION AND HYPERACTIVE-INATTENTIVE TRAIT TRAJECTORIES.

St.Pourcain B, Mandy WP, Heron J, et al.

Objective: There is overlap between an autistic and hyperactive-inattentive symptomatology when studied cross-sectionally. This study is the first to examine the longitudinal pattern of association between social-communication deficits and hyperactive-inattentive symptoms in the general population, from childhood through adolescence. We explored the interrelationship between trajectories of co-occurring symptoms, and sought evidence for shared prenatal/perinatal risk factors.

Method: Study participants were 5,383 singletons of white ethnicity from the Avon Longitudinal Study of Parents and Children (ALSPAC). Multiple measurements of hyperactive-inattentive traits (Strengths and Difficulties Questionnaire) and autistic social-communication impairment (Social Communication Disorder Checklist) were obtained between 4 and 17 years. Both traits and their trajectories were modeled in parallel using latent class growth analysis (LCGA). Trajectory membership was subsequently investigated with respect to prenatal/perinatal risk factors.

Results: LCGA analysis revealed two distinct social-communication trajectories (persistently impaired versus low-risk) and four hyperactive-inattentive trait trajectories (persistently impaired, intermediate, childhood-limited and low-risk). Autistic symptoms were more stable than those of attention-deficit/hyperactivity disorder (ADHD) behaviors, which showed greater variability. Trajectories for both traits were strongly but not reciprocally interlinked, such that the majority of children with a persistent hyperactive-inattentive symptomatology also showed persistent social-communication deficits but not vice versa. Shared predictors, especially for trajectories of persistent impairment, were maternal smoking during the first trimester, which included familial effects, and a teenage pregnancy.

Conclusions: Our longitudinal study reveals that a complex relationship exists between social-communication and hyperactive-inattentive traits. Patterns of association change over time, with corresponding implications for removing exclusivity criteria for ASD and ADHD, as proposed for DSM-5.

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Journal of the American Academy of Child & Adolescent Psychiatry. 2011 Sep;50:903-14.

RANDOMIZED CONTROLLED TRIAL OF OSMOTIC-RELEASE METHYLPHENIDATE WITH COGNITIVE-BEHAVIORAL THERAPY IN ADOLESCENTS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER AND SUBSTANCE USE DISORDERS.

Riggs PD, Winhusen T, Davies RD, et al.

Objective: To evaluate the efficacy and safety of osmotic-release methylphenidate (OROS-MPH) compared with placebo for attention-deficit/hyperactivity disorder (ADHD), and the impact on substance treatment outcomes in adolescents concurrently receiving cognitive-behavioral therapy (CBT) for substance use disorders (SUD).

Method: This was a 16-week, randomized, controlled, multi-site trial of OROS-MPH+CBT versus placebo+CBT in 303 adolescents (aged 13 through 18 years) meeting DSM-IV diagnostic criteria for ADHD and SUD. Primary outcome measures included the following: for ADHD, clinician-administered ADHD Rating Scale (ADHD-RS), adolescent informant; for substance use, adolescent-reported days of use in the past 28 days. Secondary outcome measures included parent ADHD-RS and weekly urine drug screens (UDS).

Results: There were no group differences on reduction in ADHD-RS scores (OROS-MPH: -19.2, 95% confidence interval [CI], -17.1 to -21.2; placebo, -21.2, 95% CI, -19.1 to -23.2) or reduction in days of substance use (OROS-MPH: -5.7 days, 95% CI, 4.0–7.4; placebo: -5.2 days, 95% CI, 3.5–7.0). Some secondary outcomes favored OROS-MPH, including lower parent ADHD-RS scores at 8 (mean difference=4.4, 95% CI, 0.8–7.9) and 16 weeks (mean difference=6.9; 95% CI, 2.9-10.9) and more negative UDS in OROS-MPH (mean=3.8) compared with placebo (mean=2.8; p=.04).

Conclusions: OROS-MPH did not show greater efficacy than placebo for ADHD or on reduction in substance use in adolescents concurrently receiving individual CBT for co-occurring SUD. However, OROS-MPH was relatively well tolerated and was associated with modestly greater clinical improvement on some secondary ADHD and substance outcome measures. Clinical Trial Registration Information—Attention Deficit Hyperactivity Disorder (ADHD) in Adolescents with Substance Use Disorders (SUD); <http://www.clinicaltrials.gov>; NCT00264797.

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Journal of the American Academy of Child & Adolescent Psychiatry. 2011 Oct;50:978-90.

CARDIOVASCULAR RISK OF STIMULANT TREATMENT IN PEDIATRIC ATTENTION-DEFICIT/HYPERACTIVITY DISORDER: UPDATE AND CLINICAL RECOMMENDATIONS.

Hammerness PG, Perrin JM, Shelley-Abrahamson R, et al.

Objective: This review provides an update on the cardiovascular impact of therapeutic stimulant-class medication for children and adolescents with attention-deficit/hyperactivity disorder (ADHD).

Method: Relevant clinical literature was ascertained using PubMed searches limited to human studies and the English language as of May 2011. Current practice guidelines and consensus statements also were reviewed.

Results: Stimulant-class medications for healthy children and adolescents with ADHD are associated with mean elevations in blood pressure (≈ 5 mmHg) and heart rate (≈ 10 beats/min) without changes in electrocardiographic parameters. A subset (5–15%) of children and adolescents treated may have a greater increase in heart rate or blood pressure at a given assessment or may report a cardiovascular-type complaint during stimulant treatment. It is extremely rare for a child or adolescent receiving stimulant medication to have a serious cardiovascular event during treatment, with the risk appearing similar to groups of children not receiving stimulant medication.

Conclusions: Clinicians should adhere to current recommendations regarding the prescription of stimulant medications for youth with ADHD. Scientific inquiry is indicated to identify patients at heightened risk and to continue surveillance for the longer-term cardiovascular impact of these agents.

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J Am Acad Child Adolesc Psychiatry. 2011;50:1129-39.

PHARMACOGENETIC PREDICTORS OF METHYLPHENIDATE DOSE-RESPONSE IN ATTENTION-DEFICIT/HYPERACTIVITY DISORDER.

Froehlich TE, Epstein JN, Nick TG, et al.

Objective: Because of significant individual variability in attention-deficit/hyperactivity disorder (ADHD) medication response, there is increasing interest in identifying genetic predictors of treatment effects. This study examined the role of four catecholamine-related candidate genes in moderating methylphenidate (MPH) dose-response.

Method: Eighty-nine stimulant-naïve children with ADHD 7 to 11 years old participated in a randomized, double-blind, crossover trial of long-acting MPH. Parents and teachers assessed each child's response on placebo and three MPH dosage levels using the Vanderbilt ADHD rating scales. Children were genotyped for polymorphisms in the 3' untranslated region of dopamine transporter (DAT), exon 3 on dopamine receptor D4 (DRD4), codon 158 on catechol-O-methyltransferase, and the adrenergic (α)_{2A}-receptor promoter. Linear mixed models evaluated gene, dose (milligrams per kilogram per day), and gene-by-dose effects on inattentive and hyperactive-impulsive domain outcomes.

Results: The most statistically significant gene-by-dose interactions were observed on hyperactive-impulsive symptoms for DRD4 and DAT polymorphisms, with participants lacking the DAT 10-repeat allele showing greater improvements in symptoms with increasing dose compared with 10-repeat carriers ($p = .008$) and those lacking the DRD4 4-repeat allele showing less improvement across MPH doses compared with 4-repeat carriers ($p = 0.02$).

Conclusions: This study suggests that DAT and DRD4 polymorphisms may be associated with individual variability in MPH dose-response, although further research in larger samples is required to confirm these findings and their clinical utility. Clinical trial registration information--Response Variability in Children with Attention-Deficit/Hyperactivity Disorder (ADHD); <http://www.clinicaltrials.gov>; NCT01238822.

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J Am Acad Child Adolesc Psychiatry. 2011;50:1162-72.

TELEPHONE-BASED MENTAL HEALTH INTERVENTIONS FOR CHILD DISRUPTIVE BEHAVIOR OR ANXIETY DISORDERS: RANDOMIZED TRIALS AND OVERALL ANALYSIS.

McGrath PJ, Lingley-Pottie P, Thurston C, et al.

Objective: Most children with mental health disorders do not receive timely care because of access barriers. These initial trials aimed to determine whether distance interventions provided by nonprofessionals could significantly decrease the proportion of children diagnosed with disruptive behavior or anxiety disorders compared with usual care.

Method: In three practical randomized controlled trials, 243 children (80 with oppositional-defiant, 72 with attention-deficit/hyperactivity, and 91 with anxiety disorders) were stratified by DSM-IV diagnoses and randomized to receive the Strongest Families intervention (treatment) or usual care (control). Assessments were blindly conducted and evaluated at 120, 240, and 365 days after randomization. The intervention consisted of evidence-based participant materials (handbooks and videos) and weekly telephone coach sessions. The main outcome was mental health diagnosis change.

Results: Intention-to-treat analysis showed that for each diagnosis significant treatment effects were found at 240 and 365 days after randomization. Moreover, in the overall analysis significantly more children were not diagnosed as having disruptive behavior or anxiety disorders in the treatment group than the control group (120 days: $\chi^2 = 13.05$, $p < .001$, odds ratio 2.58, 95% confidence interval 1.54-4.33; 240 days: $\chi^2 = 20.46$, $p < .001$, odds ratio 3.44, 95% confidence interval 1.99-5.92; 365 days: $\chi^2 = 13.94$, $p < .001$, odds ratio 2.75, 95% confidence interval 1.61-4.71).

Conclusions: Compared with usual care, telephone-based treatments resulted in significant diagnosis decreases among children with disruptive behavior or anxiety. These interventions hold promise to increase access to mental health services. Clinical trial registration information--Strongest Families: Pediatric Disruptive Behaviour Disorder, <http://www.clinicaltrials.gov>, NCT00267579; Strongest Families: Pediatric Attention-Deficit/Hyperactivity Disorder, <http://www.clinicaltrials.gov>, NCT00267605; and Strongest Families: Pediatric Anxiety, <http://www.clinicaltrials.gov>, NCT00267566. (copyright) 2011 American Academy of Child and Adolescent Psychiatry.

Measurement and Evaluation in Counseling and Development. 2011 Oct;44:215-24.

ASSESSING AD/HD IN COLLEGE STUDENTS: PSYCHOMETRIC PROPERTIES OF THE BARKLEY SELF-REPORT FORM.

Ladner JM, Schulenberg SE, Smith CV, et al.

The Barkley Current Symptoms Scale (BCSS)–Self-Report Form was designed to assess attention-deficit/hyperactivity disorder. The purpose of the current study was to add to BCSS psychometric literature in a sample of university students. Comparisons with normative data are provided, and implications for these findings are offered.

Neuropsychology. 2011 Nov;25:711-19.

IDENTIFYING A DISTINCTIVE FAMILIAL FREQUENCY BAND IN REACTION TIME FLUCTUATIONS IN ADHD.

Helps SK, Broyd SJ, Bitsakou P, et al.

Objective: Patients with ADHD are typically more variable in their reaction times (RT) than control children. Signal processing analyses have shown that time series RT data of children with ADHD have a distinctive low frequency periodic structure suggestive of a pattern of occasional spontaneous performance lapses. Here we use a fine-grained analysis of spectral power across a broader frequency range to differentiate the periodic qualities of ADHD time series RT data from (a) 1/frequency noise, and (b) control performance. We also assess the familiarity of these frequencies by using a proband-sibling design.

Method: Seventy-one children with ADHD, one of their siblings, and 50 control participants completed a simple RT task. Power across the RT frequency spectrum was calculated. The frequencies significantly differentiating the two groups were identified. Familiarity was assessed in two ways: first, by comparing probands with their unaffected siblings and controls, and, second, by investigating the siblings of neuropsychologically impaired and unimpaired children with ADHD.

Results: Analyses converged to highlight the potential importance of the .20–.26 Hz band in differentiating the periodic structure of ADHD RT time series data from both 1/frequency noise and control performance. This frequency band also showed the strongest evidence of familiarity.

Conclusions: RT performance of children with ADHD had a distinctive periodic structure. The band identified as most differentiating and familial was at a higher frequency than in most previous reports. This highlights the importance of employing tasks with faster interstimulus intervals that will allow a larger portion of the frequency spectrum to be examined.

Neurosci Behav Physiol. 2011;1-5.

DIAGNOSIS OF ATTENTION DEFICIT HYPERACTIVITY DISORDER USING A CONDITIONED REFLEX APPROACH.

Albertin SV.

A conditioned reflex method was developed for the diagnosis of attention deficit hyperactivity disorder using an automated apparatus containing a radial maze with a hidden search object (reward), where successful task solution depended on the subject's attention to the spatial locations of sensory signals indicating the location of the search object in the maze. This method increases the accuracy of the diagnosis of attention deficit hyperactivity in children of preschool and school age and decreases test duration.

New Engl J Med. 2011;365:1896-904.

ADHD DRUGS AND SERIOUS CARDIOVASCULAR EVENTS IN CHILDREN AND YOUNG ADULTS.

Cooper WO, Habel LA, Sox CM, et al.

BACKGROUND: Adverse-event reports from North America have raised concern that the use of drugs for attention deficit-hyperactivity disorder (ADHD) increases the risk of serious cardiovascular events.

METHODS: We conducted a retrospective cohort study with automated data from four health plans (Tennessee Medicaid, Washington State Medicaid, Kaiser Permanente California, and OptumInsight Epidemiology), with 1,200,438 children and young adults between the ages of 2 and 24 years and 2,579,104 person-years of follow-up, including 373,667 person-years of current use of ADHD drugs. We identified serious cardiovascular events (sudden cardiac death, acute myocardial infarction, and stroke) from healthplan data and vital records, with end points validated by medical-record review. We estimated the relative risk of end points among current users, as compared with nonusers, with hazard ratios from Cox regression models.

RESULTS: Cohort members had 81 serious cardiovascular events (3.1 per 100,000 person-years). Current users of ADHD drugs were not at increased risk for serious cardiovascular events (adjusted hazard ratio, 0.75; 95% confidence interval [CI], 0.31 to 1.85). Risk was not increased for any of the individual end points, or for current users as compared with former users (adjusted hazard ratio, 0.70; 95% CI, 0.29 to 1.72). Alternative analyses addressing several study assumptions also showed no significant association between the use of an ADHD drug and the risk of a study end point.

CONCLUSIONS: This large study showed no evidence that current use of an ADHD drug was associated with an increased risk of serious cardiovascular events, although the upper limit of the 95% confidence interval indicated that a doubling of the risk could not be ruled out. However, the absolute magnitude of such an increased risk would be low. (Funded by the Agency for Healthcare Research and Quality and the Food and Drug Administration.)

Pediatr Neurol. 2011;45:387-91.

CORTICAL THICKNESS IN FETAL ALCOHOL SYNDROME AND ATTENTION DEFICIT DISORDER.

Fernandez-Jaen A, Fernandez-Mayoralas DM, Quinones Tapia D, et al.

Fetal alcohol syndrome represents the classic and most severe manifestation of epigenetic changes induced by exposure to alcohol during pregnancy. Often these patients develop attention deficit

hyperactivity disorder. We analyzed cortical thickness in 20 children and adolescents with fetal alcohol syndrome and attention deficit hyperactivity disorder (group 1), in 20 patients without fetal alcohol syndrome (group 2), and in 20 control cases. The first group revealed total cortical thickness significantly superior to those of the other two groups. In per-lobe analyses of cortical thickness, group 1 demonstrated greater cortical thickness in the frontal, occipital, and right temporal and left frontal lobes compared with the second group, and in both temporal lobes and the right frontal lobe compared with the control group. This study demonstrated greater cortical thickness in patients with attention deficit hyperactivity disorder and heavy prenatal exposure to alcohol, probably as an expression of immature or abnormal brain development.

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Pediatr Neurol. 2011;45:381-86.

EFFECT OF TRANSDERMAL METHYLPHENIDATE WEAR TIMES ON SLEEP IN CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER.

Ashkenasi A.

Sleep disturbances are common among children and adolescents with attention deficit hyperactivity disorder. This study sought to evaluate the effects of individualizing wear times of the methylphenidate transdermal system on sleep parameters. In this open-label, randomized trial, 26 children with attention deficit hyperactivity disorder and sleep disturbances were randomized (after dose optimization) to one of four groups with different sequences of patch wear times (i.e., 9, 10, 11, and 12 hours per day wear times each for week in different sequences). The primary endpoint comprised sleep latency. Secondary endpoints included total sleep time, sleep quality, and attention deficit hyperactivity disorder and related signs (assessed with Attention Deficit Hyperactivity Disorder Rating Scale-IV and Connor's Global Impression-Parent). A mixed-effects regression model evaluated the effects of patch wear time on sleep and symptom measures. Patch wear time exerted no significant effect on sleep latency or total sleep time, although a trend toward improved sleep quality was evident ($P = 0.059$) with longer patch wear times. Sleep parameters were not adversely affected by longer methylphenidate transdermal system patch wear times. Thus, if replicated in larger samples, the individualization of patch wear times should be considered according to the needs and responses of patients.

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Pediatrics. 2011;128:1007-22.

ADHD: CLINICAL PRACTICE GUIDELINE FOR THE DIAGNOSIS, EVALUATION, AND TREATMENT OF ATTENTION-DEFICIT/HYPERACTIVITY DISORDER IN CHILDREN AND ADOLESCENTS.

Wolraich M, Brown L, Brown RT, et al.

Attention-deficit/hyperactivity disorder (ADHD) is the most common neurobehavioral disorder of childhood and can profoundly affect the academic achievement, well-being, and social interactions of children; the American Academy of Pediatrics first published clinical recommendations for the diagnosis and evaluation of ADHD in children in 2000; recommendations for treatment followed in 2001.

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PLoS ONE. 2011;6.

WORKING MEMORY IN ATTENTION DEFICIT/HYPERACTIVITY DISORDER IS CHARACTERIZED BY A LACK OF SPECIALIZATION OF BRAIN FUNCTION.

Fassbender C, Schweitzer JB, Cortes CR, et al.

Working memory impairments are frequent in Attention Deficit/Hyperactivity Disorder (ADHD) and create problems along numerous functional dimensions. The present study utilized the Visual Serial Addition Task (VSAT) and functional magnetic resonance imaging (fMRI) to explore working memory processes in thirteen typically developing (TD) control and thirteen children with ADHD, Combined type. Analysis of Variance (ANOVA) was used to examine both main effects and interactions. Working memory-specific

activity was found in TD children in the bilateral prefrontal cortex. In contrast the within-group map in ADHD did not reveal any working-memory specific regions. Main effects of condition suggested that the right middle frontal gyrus (BA6) and the right precuneus were engaged by both groups during working memory processing. Group differences were driven by significantly greater, non-working memory-specific, activation in the ADHD relative to TD group in the bilateral insula extending into basal ganglia and the medial prefrontal cortex. A region of interest analysis revealed a region in left middle frontal gyrus that was more active during working memory in TD controls. Thus, only the TD group appeared to display working memory-modulated brain activation. In conclusion, children with ADHD demonstrated reduced working memory task specific brain activation in comparison to their peers. These data suggest inefficiency in functional recruitment by individuals with ADHD represented by a poor match between task demands and appropriate levels of brain activity.

Psychiatr Psychol Klin. 2011;11:72-82.

THE "RIGHT-HEMISPHERIC" LANGUAGE COMMUNICATION AND INTELLECTUAL FUNCTIONING IN CHILDREN WITH ADHD.

Jedrzejowska N, Borkowska AR.

The studies were aimed at determining the level of functioning in the children with ADHD within language communication using the significant activity of the right cerebral hemisphere. In the context of the investigated language processes, the issues of ADHD children's intellectual functioning and its correlation with the "right-hemispheric" language communication skills seem interesting. The participants of the studies were 30 boys with symptoms of ADHD and 30 healthy boys in 2 age groups: 8-11 and 12-14 years. The WISC-R was used to evaluate the examinees' cognitive functioning and the Right Hemisphere Language Battery - RHLB-PL and a modified version of RHLB-PL with experimental trials adjusted to younger children, elaborated by the authors. The criterial and control groups did not differ significantly in the intelligence quotient values in the full, verbal and nonverbal scale of WISC-R, i.e. the main indicators of the cognitive skills level. However, three subtests of the Intelligence Scale differentiate between the group of children with ADHD and the group without ADHD. The children with ADHD find it more difficult to perform the tasks within the Arithmetic subtest and Mazes subtests, but they appear to do better with the Object Assembly subtest tasks. No differences were found between the subjects with ADHD and without the disorder in the measures of the "right-hemispheric" language functioning in both age groups. Moderate positive correlations were found between the IQ in the full, verbal and nonverbal scales and subtests of the WISC-R verbal scale and results of RHLB-PL.

Psychiatr Psychol Klin. 2011;11:115-19.

THE DIAGNOSIS OF ATTENTION-DEFICIT/HYPERACTIVITY DISORDER IN PRESCHOOL CHILDREN.

Orylska A, Jagielska G.

The research shows that approximately 4.9% of preschool-aged children meet the criteria for ADHD. However, the diagnosis at this age is quite difficult because ADHD criteria describe symptoms of school-aged children. The diagnosis of ADHD in preschool is rarely investigated or described. However, an early diagnosis of ADHD and therapy can prevent short- and long-term consequences. The diagnostic difficulties at the preschool age are connected with the child's dynamic development, acquired social, behavioural and cognitive capabilities. ADHD can be diagnosed in preschool-aged children on the basis of the child's development and family interview, clinical interview including ADHD symptoms described on ICD-10 and DSM-IV-TR. An indispensable diagnostic step in ADHD is the differential diagnosis. The article emphasizes the importance of the tools which should be used during the diagnostic process. The Conners Early Childhood aids in the early identification of behavioural, social, and emotional problems for preschool children aged from 2 to 6. The CEC also assists in measuring whether or not the child is appropriately meeting major developmental milestones (Adaptive Skills, Communication, Motor Skills, Play, and Pre-Academic/ Cognitive). The Behaviour Rating Inventory of Executive Function - Preschool (BRIEF-P) is the tool for screening, assessing, and monitoring of a young child's executive functioning and development

(age from 2 to 5). The article tries to explain the difficulty of the diagnostic process in ADHD children at such a young age. Additionally, it presents some tools with which to diagnose and prescribe children at the preschool age.

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Res Autism Spectr Disord. 2012;6:277-85.

AUTISM AND ADHD: OVERLAPPING AND DISCRIMINATING SYMPTOMS.

Mayes SD, Calhoun SL, Mayes RD, et al.

Children with ADHD and autism have some similar features, complicating a differential diagnosis. The purpose of our study was to determine the degree to which core ADHD and autistic symptoms overlap in and discriminate between children 2-16 years of age with autism and ADHD. Our study demonstrated that 847 children with autism were easily distinguished from 158 children with ADHD. All children with autism had 15 or more of the 30 Checklist for Autism Spectrum Disorder symptoms (mean 22), and none of the children with ADHD did (mean 4). Three of the symptoms were present only in children with autism. Almost all 30 symptoms were found in over half of the children with autism, whereas none were present in the majority of children with ADHD-Inattentive type (ADHD-I) or in children with ADHD-Combined type (ADHD-C) without comorbid oppositional-defiant disorder. In contrast, ADHD symptoms were common in autism. Children with low and high functioning autism and ADHD-C did not differ on maternal ratings of attention deficit, impulsivity, and hyperactivity. For children with normal intelligence, nonsignificant differences were found between children with autism, ADHD-C, and ADHD-I on neuropsychological tests including measures of attention, working memory, processing speed, and graphomotor skills.

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Res Autism Spectr Disord. 2012;6:500-07.

PARENTAL AGE AND ASSISTED REPRODUCTIVE TECHNOLOGY IN AUTISM SPECTRUM DISORDERS, ATTENTION DEFICIT HYPERACTIVITY DISORDER, AND TOURETTE SYNDROME IN A JAPANESE POPULATION.

Shimada T, Kitamoto A, Todokoro A, et al.

We investigated whether advanced parental age and assisted reproductive technology (ART) are risk factors in autism spectrum disorders (ASDs), attention deficit hyperactivity disorder (ADHD), and Tourette syndrome (TS). Clinical charts of Japanese outpatients with ASD (n = 552), ADHD (n = 87), and TS (n = 123) were reviewed. Parental age of individuals with ASD, ADHD, or TS was compared with parental age in the general population (GP) of Tokyo after adjusting for year of birth. Paternal and maternal ages were significantly higher in persons with ASD and ADHD, but not those with TS. In final steps of stepwise logistic regression analysis, both maternal and paternal age were associated with ASD after controlling for the other parent's age, gender, and birth order. In cases where the presence or absence of ART could be ascertained (ASD n = 467; ADHD n = 64; TS n = 83), the rate of ART in cases of persons with ASD (4.5%) was 1.8 times the frequency expected in the GP, while ART was not present in cases of persons with ADHD and TS. These preliminary results remain tentative pending replication with larger, community-based samples.

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Res Dev Disabil. 2011;33:357-61.

THE INVESTIGATION OF ADHD PREVALENCE IN KINDERGARTEN CHILDREN IN NORTHEAST IRAN AND A DETERMINATION OF THE CRITERION VALIDITY OF CONNERS' QUESTIONNAIRE VIA CLINICAL INTERVIEW.

Abdekhodaie Z, Tabatabaei SM, Gholizadeh M.

In this study, the prevalence of attention-deficit hyperactivity disorder (ADHD) in kindergarten children in northeast Iran was investigated, and the criterion validity of Connors' parent-teacher questionnaire was evaluated through the use of clinical interviews. This study was a cross-sectional descriptive research project with children in kindergartens that was supported by the Behzisti Organization, which included 155 kindergartens and 4143 children. To study the prevalence of ADHD, cluster random sampling was used;

1083 children were chosen as a reference, and random sampling was used to determine the criterion validity. Twenty-two children scoring below a specified cut-off score and 32 children scoring above the cut-off score were interviewed. In the first stage, ADHD was assessed using Conners' parent-teacher questionnaire, and in the second stage, it was assessed with a clinical interview based on DSM-IV-TR criteria. Finally, the prevalence rate was evaluated with descriptive parameters, and the criterion validity was assessed using the tetracoric correlation coefficient. The prevalence of ADHD was estimated at 12.3%. (plus or minus). 2.12%. Moreover, test sensitivity and specificity were evaluated at 90.3% and 81.2%, respectively. Therefore, the criterion validity with $\alpha = 0.05$ is 90.3%. The prevalence of ADHD among children was high, suggesting a need to screen all children for ADHD before school age. The Conners' questionnaire proved to be a good test for the primary screening of ADHD among kindergarten children.

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Res Dev Disabil. 2011;33:538-48.

TEMPORAL PROCESSING IMPAIRMENT IN CHILDREN WITH ATTENTION-DEFICIT-HYPERACTIVITY DISORDER.

Huang J, Yang BR, Zou XB, et al.

The current study aimed to investigate temporal processing in Chinese children with Attention-Deficit-Hyperactivity Disorder (ADHD) using time production, time reproduction paradigm and duration discrimination tasks. A battery of tests specifically designed to measure temporal processing was administered to 94 children with ADHD and 100 demographically matched healthy children. A multivariate analysis of variance (MANOVA) and a repeated measure MANOVA indicated that children with ADHD were impaired in time processing functions. The results of pairwise comparisons showed that the probands with a family history of ADHD performed significantly worse than those without family history in the time production tasks and the time reproduction task. Logistic regression analysis showed duration discrimination had a significant role in predicting whether the children were suffering from ADHD or not, while temporal processing had a significant role in predicting whether the ADHD children had a family history or not. This study provides further support for the existence of a generic temporal processing impairment in ADHD children and suggests that abnormalities in time processing and ADHD share some common genetic factors.

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Res Dev Disabil. 2012;33:196-204.

DIFFERENTIATING CHILDREN WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER, CONDUCT DISORDER, LEARNING DISABILITIES AND AUTISTIC SPECTRUM DISORDERS BY MEANS OF THEIR MOTOR BEHAVIOR CHARACTERISTICS.

Efstratopoulou M, Janssen R, Simons J.

The study was designed to investigate the discriminant validity of the Motor Behavior Checklist (MBC) for distinguishing four groups of children independently classified with Attention-Deficit/Hyperactivity Disorder (ADHD; N= 22), Conduct Disorder (CD; N= 17), Learning Disabilities (LD; N= 24) and Autistic Spectrum Disorders (ASD; N= 20). Physical education teachers used the MBC for children to rate their pupils based on their motor related behaviors. A multivariate analysis revealed significant differences among the groups on different problem scales. The results indicated that the MBC for children may be effective in discriminating children with similar disruptive behaviors (e.g., ADHD, CD) and autistic disorders, based on their motor behavior characteristics, but not children with Learning Disabilities (LD), when used by physical education teachers in school settings.

School Mental Health. 2011 Sep;3:143-55.

REFINEMENT OF AN ORGANIZATIONAL SKILLS INTERVENTION FOR ADOLESCENTS WITH ADHD FOR IMPLEMENTATION BY SCHOOL MENTAL HEALTH PROVIDERS.

Langberg JM, Vaughn AJ, Williamson P, et al.

The purpose of the study was to modify, test, and refine the Homework, Organization, and Planning Skills (HOPS) intervention for adolescents with ADHD for use by school mental health (SMH) providers. Ten SMH providers from three school districts implemented the HOPS intervention with 11 middle school students with ADHD. Parent and teacher ratings of materials organization and homework management were collected pre- and post-intervention and treatment fidelity was assessed. SMH providers and teachers participated in focus groups and provided feedback on ways to improve the feasibility and usability of the HOPS intervention. Students made large improvements in organizational skills ($d = 1.8$) and homework problems ($d = 1.6$) according to parent ratings; however, no improvements were observed on teacher ratings. Qualitative data generated from coding the focus groups and audio-recorded HOPS sessions were combined with the quantitative results to systematically refine the HOPS intervention for further evaluation of intervention effectiveness and disseminability.

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School Mental Health. 2011 Sep;3:169-77.

THE ESTIMATED ANNUAL COST OF ADHD TO THE US EDUCATION SYSTEM.

Robb JA, Sibley MH, Pelham WE, Jr., et al.

The purpose of this study was to examine and monetize the educational outcomes of students with ADHD. Data were examined from the Pittsburgh ADHD Longitudinal Study, a follow-up study of children diagnosed with ADHD in childhood and recontacted for followup in adolescence and young adulthood. A comprehensive educational history was obtained for all participants from Kindergarten through 12th grade. Annual economic impact was derived from costs incurred through special education placement, grade retention, and disciplinary incidents. Results indicated that, as compared to students without ADHD, students with ADHD incurred a higher annual cost to the US Education system. Specifically, a student with ADHD incurred an average annual incremental cost to society of \$5,007, as compared with \$318 for students in the comparison group. These results suggest that prevention and intervention strategies are greatly needed to offset the large financial impact of educating youth with ADHD.

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School Mental Health. 2011 Sep;3:117-26.

EARLY INTERVENTION FOR YOUNG CHILDREN WITH ADHD: ACADEMIC OUTCOMES FOR RESPONDERS TO BEHAVIORAL TREATMENT.

DuPaul GJ, Kern L, Gormley MJ, et al.

Symptoms of attention-deficit/hyperactivity disorder (ADHD) generally emerge in early childhood, and research has demonstrated that early intervention can effectively reduce those symptoms. Little attention, however, has addressed pre-academic skills in spite of data indicating older students with ADHD are at high risk for academic failure. In the current study, we examined whether behavioral response to psychosocial intervention was associated with improvement in early reading and math skills 12 and 24 months post-intervention. Participants were 41 children, 3–6 years old who received a comprehensive early intervention package across 6 months. Some differences in pre-academic skill performance between behavioral responders and non-responders (based on changes in oppositional behavior) were observed at 12 months; however, few differences maintained after 24 months. Behavioral responders (based on changes in ADHD behavior) showed improvements on only one measure (early numeracy). The findings underscore the need for specific pre-academic skill interventions in the context of ongoing behavioral interventions.

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School Mental Health. 2011 Sep;3:127-42.

FROM CLINIC TO SCHOOL: TRANSLATING A COLLABORATIVE SCHOOL-HOME BEHAVIORAL INTERVENTION FOR ADHD.

Pfiffner LJ, Kaiser NM, Burner C, et al.

In an attempt to address the gaps in evidence-based school services for ADHD, we adapted a research-supported clinic-based behavioral intervention for ADHD for delivery by school-based mental health professionals within an urban public school district. We applied a collaborative iterative development process in which we trained existing school-based mental health professionals, supervised their implementation of the intervention in successive schools, and collected data regarding fidelity, feasibility, and acceptability. These data were used to further refine and develop our intervention and training methods for subsequent iterations. Results provide preliminary evidence supporting the positive impact of this methodology on treatment development. Significant pre- to post-treatment improvement in ADHD symptoms, problem behaviors, social skills, and organizational skills support the effectiveness of this adapted treatment in improving student outcomes. These findings illustrate the utility of a collaborative model for translating empirically based clinic services for children to educational settings.

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School Mental Health. 2011 Sep;3:156-68.

POTENTIAL MECHANISMS OF ACTION IN THE TREATMENT OF SOCIAL IMPAIRMENT AND DISORGANIZATION IN ADOLESCENTS WITH ADHD.

Sadler JM, Evans SW, Schultz BK, et al.

Two important domains that can be impaired in adolescents with ADHD are organization and social functioning; however, the development of interventions to target these areas in adolescents is in the early stages. Currently, small efficacy trials are beginning to be used to conduct preliminary tests on the proposed mechanisms of action for these interventions. These two studies examined the efficacy of organization and social functioning interventions for adolescents with ADHD, as well as the potential mechanisms of action for each intervention. Results from the organization intervention provide support for a significant relationship between performance on the organization checklist and overall GPA; however, there was no meaningful pattern of relationships between achieving mastery of the organization tasks and grades within quarter. Further, results from the social functioning intervention support a moderate relationship between performance on process measures of response to the intervention and outcome measures of social functioning. Results of this study provide implications for modifications to the measures and intervention procedures in future research. (

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Sleep Biol Rhythms. 2011;9:204.

SLEEP IN CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER.

Owens J.

Sleep disturbances are a significant clinical problem in children with attention deficit hyperactivity disorder (ADHD) and may impact on daytime functioning. There are many potential causes of sleep problems in these children and these range from psychostimulant-related sleep onset delay to bedtime resistance related to comorbid oppositionality to circadian-mediated sleep phase delays. This presentation will outline a comprehensive clinical approach to the diagnosis and management of sleep problems in children with ADHD.

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Sleep Breathing. 2011;15:455-62.

APNEA-HYPOPNEA INDICES AND SNORING IN CHILDREN DIAGNOSED WITH ADHD: A MATCHED CASE-CONTROL STUDY.

Galland BC, Tripp EG, Gray A, et al.

Objectives: To measure apnea-hypopnea indices and snoring in children diagnosed with attention-deficit hyperactivity disorder (ADHD) in a case-control design. Additionally, the study design allowed us to investigate whether or not methylphenidate had any effect on breathing variables.

Methods: Twenty-eight children (22 boys) aged 6-12 years meeting diagnostic criteria for Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV ADHD were studied together with matched controls. Two nights of polysomnography (PSG) were conducted that included recordings of snoring waveforms. A randomly assigned 48-h on-off medication protocol was used for ADHD children. Control children's recordings were matched for PSG night, but medication was not used. A low apnea-hypopnea index (AHI) threshold of >1 event per hour was used to define sleep-disordered breathing (SDB) because of a clinical relevance in ADHD.

Results: Categorical analyses for paired binary data showed no significant differences between control and ADHD children for presence of an AHI >1 or snoring. Variables were extracted from a significantly shorter total sleep time (67 min) on the medication night in children with ADHD. Eight (28%) control and 11 (40%) ADHD children snored >60 dB some time during the night. Methylphenidate had no effect on central apneas, AHI, desaturation events, or any snoring data.

Conclusions: Our PSG findings show no strong link between ADHD and SDB although our findings could be limited by a small sample size. Findings from PSG studies in the literature argue both for and against an association between ADHD and SDB. Our results suggest medication is not a factor in the debate.

Trace Elem Electrolytes. 2011;28:249.

MAGNESIUM AND ADHD.

Liebscher DH, Liebscher U.

The authors propose nullMagnesium and ADHD-recommendationsnull. The aim of these recommendations is to detect and treat magnesium deficiency in patients with ADHD. It is intended to improve the interdisciplinary therapy of ADHD, reducing the use of psychotropics and increasing patient safety at the same time. Magnesium should be given consideration as an essential building block of a multimodal ADHD therapy. The physiological and pathophysiological importance of Mg as a natural calcium antagonist, NMDA receptor blocker and anti-stressor has been extensively described. The ADHD triad of hyperactivity, impulsiveness and attention disorder also comprises symptoms that can be ascribed to Mg deficiency (characterized by hyperexcitability and fatigue). Several international research groups have presented studies on Mg deficiency, which is common with ADHD (up to 80%), and on the effectiveness of Mg for ADHD, all showing the same trend of results. Untreated Mg-deficiency causes numerous secondary problems. This makes an early consideration of the Mg deficiency symptoms including ADHD symptoms all the more important. The Mg status must be diagnosed in every ADHD patient (medical history, clinical symptoms, laboratory values, oral Mg stress test). Key symptoms and risk-increasing factors of Mg deficiency need to be taken in consideration. It is recommended to start Mg substitution in symptomatic patients and at serum Mg levels < 0.9 mmol/l. The required Mg dose must be titrated against the disappearance of symptoms. The dosage is at least 240 -480 mg, usually more than 600 mg Mg per day, referring to the body weight of adults. In children, the dose needs to be reduced according to body weight.

Value Health. 2011;14:A294-A295.

THE QUALITY OF LIFE OF CHILDREN WITH ADHD AND THEIR PARENTS: RESULTS OF EQ-5D AND KIDSCREEN-10.

Van Der Kolk A, Bouwmans C, Schawo S, et al.

OBJECTIVES: The aim of this study is to describe the Quality of Life (QoL) of children with Attention Deficit Hyperactivity Disorder (ADHD) and their parents. The objective was to compare QoL in different states of compliance to medication (methylphenidate and atomoxetine), in remission status after medication use or

being naive to medication using EQ-5D (proxy version for the children) and KIDSCREEN- 10 (KS) questionnaires.

METHODS: A cross-sectional, retrospective, survey was performed using online questionnaires (September 1, 2010 to October 3, 2010) that was completed by the parent/caregiver. Inclusion criterion was being a parent/caregiver of a child (age 6-18 years) diagnosed with ADHD. Parents/caregivers were contacted via the Dutch patient organization. Subgroups of medication use were defined by parents as 'optimal', 'suboptimal', 'remission' and 'medication use stopped' according to current medication intake. The fifth group were children who never used ADHD-medication. QoL data of the child and the parent were compared in these different groups of medication intake, using Students' t-tests for continuous variables and Kruskal-Wallis tests for categorical data.

RESULTS: Analyses were performed on 873 returned questionnaires. The QoL in the classified groups are described here for children (proxy EQ-5D and KS) and parents (EQ-5D). Optimal compliance: proxy EQ-5D 0.8257, KS 47.5152, EQ-5D 0.8331. Suboptimal compliance: proxy EQ-5D 0.7321, KS 42.7671, EQ-5D 0.8050. Medication use stopped: proxy EQ-5D 0.7635, KS 42.5969, EQ-5D 0.8169. Remission after medication use: proxy EQ-5D 0.8518, KS 45.8929, EQ-5D 0.8220. Naive to medication: proxy EQ-5D 0.7719, KS 43.3744, EQ-5D 0.7899.

CONCLUSIONS: Children with a good compliance to medication and naive children have a better QoL compared to non-compliant children and children who stopped treatment (non-remission). The QoL of children in remission is better than the QoL of children using medication. QoL of parents follows a similar pattern.

Value Health. 2011;14:A550.

THE USE OF METHYLPHENIDATE IN A GROUP OF PATIENTS WITH ATTENTION DEFICIT AND HYPERACTIVITY DISORDER.
Gomez-Galicia DL, Rodriguez-Fragoso L, Lopez Aymes G, et al.

OBJECTIVES: to describe the use of stimulants in a group of Mexican children with ADHD in order to know some pharmacoepidemiological data

METHODS: An observational and descriptive study in pediatrics patients based on a survey in a one year period (June 2009 to June 2010) was done. Survey was answered by children parents who signed an informed consent. Patients with diagnosis of ADHD and/or received stimulant treatment with and without co-morbidity were considering.

RESULTS: Of 124 surveys, 85 were selected according to inclusion criteria. 61.2% of patients received pharmacologic treatment; the drug most use among them was the stimulant methylphenidate (94%). The mean age of stimulant users was 7.94 years (4-13 years), 81.2% were male, 76.5% were in a primary school and 94% had a nonpharmacologic treatment. The average daily dose was 13.95mg. Immediate release was the most prescribed form in three different commercial presentations, and 8% received the long term release. Children with seven years old were who received more methylphenidate prescription. The age and having a comorbidity increased the probability (p0.005) for receiving methylphenidate treatment. The most frequent side effect reported was loss of appetite.

CONCLUSIONS: Methylphenidate in an immediate action form was the most prescribed stimulant drug in seven years old children with ADHD in the population studied. High percentage of children received methylphenidate treatment

Value Health. 2011;14:A290.

ECONOMIC BURDEN OF ATTENTION DEFICIT HYPERACTIVITY DISORDER IN CHILDREN AND ADOLESCENTS IN EUROPE.
Taneja A, Ahuja A, Kataria A, et al.

OBJECTIVES: This comprehensive review was conducted to report existing evidence from published studies evaluating the economic burden of attention deficit hyperactivity disorder (ADHD) in children and adolescents in Europe.

METHODS: A systematic search of electronic literature databases (EMBASE and MEDLINE), was conducted from January 2001 to June 2011 to identify economic studies on ADHD in children and

adolescents in Europe. All economic studies in English language, regardless of design and intervention were included. Eligibility of trials was assessed by two reviewers with any discrepancy reconciled by a third, independent reviewer.

RESULTS: A total of 591 citations were retrieved out of which eight met pre-defined inclusion criteria. Five studies were cost-analyses while three were cost-effectiveness analyses. In Germany, the total direct costs for ADHD were (euro)158 million in 2002 which increased to (euro)287 million in 2006 with inpatient treatment costs comprising approximately 40% of the total direct costs in 2006 (Wehmeier 2009). Other contributors to total direct costs included hospitalisations, special health-care services, comorbidities, and physician visits (Ridder 2006). The total projected costs of ADHD in Germany during 2012 are estimated to be (euro)311 million (Schlander 2007). The mean annual direct medical costs of ADHD patients with psychiatric comorbidities were (euro)5908 compared to (euro)974 for ADHD alone in the The Netherlands (Roijen 2007). The cost-effectiveness studies retrieved primarily focused on atomoxetine (ATX) and methylphenidate (MPH). ATX was found to be more cost-effective than MPH in the UK (ICER of (pounds)15 224 per QALY gained) (Cottrell 2008) as well as in Spain (ICER of (euro)34 308 per QALY gained) (Hong 2009).

CONCLUSIONS: ADHD is associated with substantial fiscal burden in Europe. Since 2002, a trend of increase in direct costs has been observed which may be due to increasing demand for healthcare services, and presence of comorbidities.

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INDIVIDUAZIONE PRECOCE DEL DISTURBO DA DEFICIT DI ATTENZIONE/IPERATTIVITÀ (DDAI-ADHD) NELLA SCUOLA DELL'INFANZIA

Dario Ianes e Vanessa Macchia

Durata: 2004-2010

La ricerca è stata attivata come progetto di ricerca di Vanessa Macchia nel suo percorso di dottorato. Sono stati raccolti i dati su circa 900 bambini in uscita dalle scuole dell'infanzia di lingua italiana della Provincia di Bolzano attraverso tre strumenti (Scala SDAIL, Scala Conners, Scheda osservativa informale). L'analisi di questi ha dato i primi risultati riguardo alla predittività degli strumenti scelti per l'individuazione precoce dei bambini che hanno un rischio iperattività. Questa analisi è stata poi approfondita con un secondo anno di screening.

A questa prima fase è seguita la progettazione e di materiali e attività che le insegnanti della scuola dell'infanzia possono proporre per accompagnare lo sviluppo di attenzione e concentrazione.

Pubblicazioni:

- Ianes D. e Macchia V. (2008), *Individuazione precoce del disturbo da deficit di Attenzione/Iperattività (DDAI-ADHD) nella scuola dell'infanzia*, in atti del XVII Congresso Nazionale AIRIPA – *I disturbi dell'apprendimento*, pp.17-19
- Macchia V e Zambotti F. (2009), *Valutazione didattica e identificazione precoce nella scuola dell'infanzia come strategia per l'inclusione*. L'integrazione scolastica e sociale, vol. vol.8, n.5; pp. 485-504, Trento, Erickson

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Considerando il recente avvio del Registro regionale Lombardo per l'ADHD, il programmato avvio di altri registri regionali e di una nuova forma ridotta di registro Nazionale, la possibile autorizzazione all'immissione al commercio per alcune formulazioni a lento rilascio per il prossimo anno, e l'interesse suscitato dalle scorse edizioni, è in preparazione il

4° Workshop sull'ADHD

che si terrà a

Cagliari dall'8 al 10 Marzo 2012.

Quest'anno parteciperanno allo workshop anche alcuni colleghi europei che stimoleranno la discussione su argomenti controversi (p. es., comorbidità con Disturbi pervasivi dello sviluppo e/o ritardo mentale, neuro feedback come pratica terapeutica, efficacia degli interventi non farmacologici).

Come lo scorso anno lo workshop sarà articolato in Letture, Simposi, Dibattiti e Poster, cui si aggiungeranno i Seminari. I Seminari si svolgeranno in piccoli gruppi (25-30 partecipanti) e avranno due animatori (un italiano e uno straniero). I risultati di ciascun Seminario saranno riportati nella sessione plenaria per la discussione collettiva.

Alcuni dei temi saranno ulteriormente discussi nell'ambito della *EUNETHYDIS 2nd International ADHD Conference* che si terrà a Barcellona il 23-25 Maggio.

Per maggiori informazioni: <http://eunethydisconference.com/index.html>

Alessandro Zuddas, Maurizio Bonati, Antonella Costantino, Gabriele Masi, Pietro Panei

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