INDICE:

1. Bibliografia articoli ADHD pag. 2

2. Progetto Regionale “Condivisione di percorsi diagnostico-terapeutici per l’ADHD in Lombardia” pag. 34

3. Percorso formativo per operatori della Regione Lombardia, Progetto Regionale ADHD “Strumenti e strategie per l’avvio di interventi di training rivolti ai genitori di bambini ADHD in Lombardia” pag. 36

4. Convegno - Eugenio Medea, Associazione La Nostra Familia “Promuovere la salute mentale nell’età evolutiva” 25/10/11, Milano pag. 38


6. 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. 42
Objective: Injury is the leading cause of death among American youth, killing more 11-year-olds than all other causes combined. Children with symptoms of externalizing behavior disorders such as attention-deficit/hyperactivity disorder (ADHD) and conduct disorder (CD) may have increased risk. Our aims were to determine: (1) whether increasing symptoms of ADHD and CD associate positively with injuries among a community sample of fifth graders; and (2) whether symptoms of ADHD and CD have a multiplicative rather than additive association with injuries among the sample. Methods: Data were collected from 4745 fifth graders and their primary caregivers participating in Healthy Passages, a multisite, community-based study of pediatric health risk behaviors and health outcomes. The primary outcome was injury frequency. Primary independent variables were ADHD and CD symptoms. Additional covariates included gender, race/ethnicity, and household income. Ordinal logistic regression examined correlates of injury frequency. The interaction between ADHD and CD symptoms also was examined. Results: In bivariate analyses, the odds of injury increased as ADHD symptoms (odds ratio [OR] 1.29; 95% confidence interval [95% CI] 1.18-1.41) and CD symptoms (OR 1.18; 95% CI 1.07-1.31) increased. However, in multivariate analysis, only ADHD symptoms were significantly associated with injury (OR 1.22; 95% CI 1.10-1.35). There was no statistically significant interaction between ADHD and CD symptoms. Conclusions: ADHD symptoms are associated with increased odds of injury in fifth graders. Findings have implications for potential injury prevention strategies for mental health practitioners (for example, cognitive training with at-risk youth), pediatricians (ADHD screening), and parents (improved supervision).

**A POTENTIAL DIAGNOSTIC BLOOD TEST FOR ATTENTION DEFICIT HYPERACTIVITY DISORDER.**

*Woodruff DB, El-Mallakh RS, Thiruvengadam AP.*

Diagnosis of attention deficit hyperactivity disorder (ADHD) in children, adolescents, and adults remains controversial. Dramatic growth in the diagnosis of this disorder in both young people and adults has focused criticism on the subjective nature of the diagnostic procedure. A new blood test that measures blood cell membrane potential (expressed as membrane potential ratio [MPR(trademark)]) has been recently developed. The current study was performed to explore the potential utility of this blood test in diagnosis of ADHD. Consecutive outpatient children (n = 89), adolescents (n = 18), and adults (n = 89) diagnosed with ADHD, or not (n = 60, 17, and 92, respectively), provided sample in which the blood test was performed. ADHD subjects were relatively depolarized with an MPR(trademark) of 0.804 (plus or minus) 0.0381, compared to non-ADHD subjects, 0.684 (plus or minus) 0.0260 (P < 0.05). The sensitivity is between 0.75 and 0.9, depending on the definition used, and the specificity is 0.75. MPR(trademark) appears to be a viable potential diagnostic tool for ADHD. Larger studies utilizing standardized diagnostic procedures, taking into account medications and comorbidity, and exploring variables such as age and gender are warranted.

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**PROTOPATHIC STIMULANT USE AMONG CHILDREN WITH SYMPTOMS OF ADHD.**

*Barnard-Brak L, To YM, Fearon DD.*

The purpose of the current study was to examine protopathic stimulant use among children with the symptoms of ADHD but do not have a diagnosis of ADHD. Protopathic or prodromal stimulant use refers to the use of stimulants by children with the symptoms of ADHD prior to a diagnosis of ADHD. In the current study, we examined children with the symptoms of ADHD who received stimulant treatment across time and with respect to several background variables. Our results indicate that these children who receive stimulant treatment without a diagnosis of ADHD are significantly more like to be eventually diagnosed with ADHD than not. Results also indicate that these children who receive stimulant treatment but do not yet have a diagnosis of ADHD are significantly more likely to have insurance that does not pay for diagnostic procedures. These results are discussed in view of treatment.

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**TRAINING OF ATTENTION FUNCTIONS IN CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER.**


Pharmacological treatment of children with ADHD has been shown to be successful; however, medication may not normalize attention functions. The present study was based on a neuropsychological model of attention and assessed the effect of an attention training program on attentional functioning of children with ADHD. Thirty-two children with ADHD and 16 healthy children participated in the study. Children with ADHD were randomly assigned to one of the two conditions, i. e., an attention training program which trained aspects of vigilance, selective attention and divided attention, or a visual perception training which trained perceptual skills, such as perception of figure and ground, form constancy and position in space. The training programs were applied in individual sessions, twice a week, for a period of four consecutive weeks. Healthy children did not receive any training. Alertness, vigilance, selective attention, divided attention, and flexibility were examined prior to and following the interventions. Children with ADHD were assessed and trained while on ADHD medications. Data analysis revealed that the attention training used in the present study led to significant improvements of various aspects of attention, including vigilance, divided attention, and flexibility, while the visual perception training had no specific effects. The findings indicate that attention training programs have the potential to facilitate attentional functioning in children with ADHD treated with ADHD drugs.

**POTENTIAL COGNITIVE ENDOPHENOTYPES IN MULTIGENERATIONAL FAMILIES: SEGREGATING ADHD FROM A GENETIC ISOLATE.**

*Pineda DA, Lopera F, Puerta IC, et al.*

Endophenotypes are neurobiological markers cosegregating and associated with illness. These biomarkers represent a promising strategy to dissect ADHD biological causes. This study was aimed at contrasting the genetics of neuropsychological tasks for intelligence, attention, memory, visual-motor skills, and executive function in children from multigenerational and extended pedigrees that cluster ADHD in a genetic isolate.

In a sample of 288 children and adolescents, 194 (67.4%) ADHD affected and 94 (32.6%) unaffected, a battery of neuropsychological tests was utilized to assess the association between genetic transmission and the ADHD phenotype. We found significant differences between affected and unaffected children in the WISC block design, PIQ and FSIQ, continuous vigilance, and visual-motor skills, and these variables exhibited a significant heritability. Given the association between these neuropsychological variables and ADHD, and also the high genetic component underlying their transmission in the studied pedigrees, we suggest that these variables be considered as potential cognitive endophenotypes suitable as quantitative trait loci (QTLs) in future studies of linkage and association.


**NO EVIDENCE FOR ASSOCIATION BETWEEN A FUNCTIONAL PROMOTER VARIANT OF THE NOREPINEPHRINE TRANSPORTER GENE SLC6A2 AND ADHD IN A FAMILY-BASED SAMPLE.**


Noradrenergic neurotransmission influences executive functions, attentional performance, and general alertness, involving neuronal networks affected in attention deficit/hyperactivity disorder (ADHD). The norepinephrine transporter facilitates the reuptake of norepinephrine and dopamine in the prefrontal cortex and represents the main target of atomoxetine, an effective drug in the treatment of ADHD. Due to its influence on catecholaminergic signaling, variants of the coding gene (SLC6A2) have been widely investigated in ADHD. Several previous studies report an association between single nucleotide polymorphisms located in SLC6A2 and ADHD; however, the findings are inconsistent. The variant A-3081T (rs28386840) has been shown to have major influence on the expression levels of SLC6A2 due to sequence alteration at a repressor binding site, with the T-allele being associated with ADHD. We tested this potential association of A-3081T in a German family-based ADHD sample of 235 children from 162 families, which has a power >99% based on the previously reported odds ratios. There was no evidence for an overtransmission of the risk allele T (transmission rate: 48.5%, P = 0.55). We conclude that A-3081T is not a major risk variant in our ADHD sample, though SLC6A2 remains an interesting candidate gene in ADHD, especially for the inattentive subtype.


**NEUROPSYCHOLOGICAL PROFILE OF INTERNATIONALLY ADOPTED CHILDREN IN CATALONIA.**


Introduction: During the last years, International adoption has increased significantly in our country over the last few years. China, Russia, Colombia and Ethiopia represent 77% of international adoptions in Spain. Cognitive and behavioural aspects are very important for an adequate social, family and school integration of these children.

Objective: To describe the neuropsychological profiles of a group of internationally adopted children in Catalonia from China, Russia, Colombia and Ethiopia.

Patients and methods: Neuropsychological examination of 49 children from international adoption (6 of Chinese origin, 24 from Russia, 13 from Colombia and 6 of Ethiopian origin).
Results: The group of Chinese origin obtained average scores of all functions evaluated. The Russian origin group was below the average for, selective attention, phonetic verbal fluency, control of impulsivity, mechanics and reading comprehension, and spelling. Scores on the impulse control in the Colombian origin group were below average. The group of Ethiopian origin obtained average scores in all functions evaluated except for spelling difficulties.

Conclusion: Children adopted from Russia have greater neuropsychological difficulties than the others. Most pre-adoption history is unknown; therefore we are unable to determine the origin of these difficulties. Maternal alcohol consumption during pregnancy and the institutional environment could be influencing factors in neuropsychological delay. Inclusion of neuropsychological assessment in health protocols for these children is recommended if they develop suggestive signs of cognitive and/or behavioral impairment.

Arts Psychother. 2011.

Self-esteem and anxiety in human figure drawing of Iranian children with ADHD.
Saneei A, Bahrami H, Haghegh SA.

This study is aimed at investigating the self-esteem and anxiety of children with Attention Deficit/Hyperactivity Disorder compared with normal children by means of Draw-A-Person Test. 30 children with ADHD were selected from psychiatric clinics of Isfahan, Iran using multi-cluster sampling. 30 normal children were also selected from public schools of Isfahan by the same method. The results were analyzed using analysis of variance and Chi-square. In this research, six criteria were selected from Draw-A-Person Test. The results revealed significant differences between the performance of the children with ADHD and normal children in terms of size and line characteristic (P < 0.05). For the other criteria no significant difference was found between these groups. Based on this finding, some aspects of drawing may be more meaningful than other aspects in drawings of children with ADHD.


The effect of bupropion in treating attention deficit hyperactivity disorder in 6-17 year old children and adolescents in Isfahan.

The aim of the study was to determine the effectiveness of bupropion to manage ADHD. In a Randomized, double blind, placebo controlled clinical trial, 40 ADHD children were divided into two groups. The study group received bupropion and the control group received placebo. Both of them took part in social skills sessions. Conner parent and teacher questionnaires were completed before, two weeks, and 4 weeks of study. The social behavior questionnaires were completed before and after the study. The Psychiatrist followed the patients and evaluated the severity of the disorder before, 2 weeks, and 4 weeks of the study. There were no significant differences between the scores on Conner questionnaire (P = 0.77, P = 0.97, P = 0.95) and social skills questionnaire (P = 0.16, P = 0.29, P = 0.47), Impulsivity (P = 0.41, P = 0.28), accepted social behavior (P = 0.87, P = 0.24), peer relationship (P = 0.28, P = 0.78), and communication skills (P = 0.61, P = 0.91) at any time of the study. The only difference was between ADHD subscale of Conner's questionnaire for teachers in the week 4 (P = 0.048). There were no statistically significant differences between the scores of severity before and at week 2 (P = 0.81, P = 0.79). But at week 4 the severity score was 0.6 greater in placebo than in control group (P = 0.044). Despite partial effects of bupropion on controlling the signs and symptoms of ADHD, further trials are needed.
**Asian J Psychiatry. 2011;4:S83.**

**THE COMPARISON OF EXECUTIVE FUNCTION IN CHILDREN WITH ATTENTION DEFICIT, HYPERACTIVE CHILDREN AND NORMAL CHILDREN OF ARAK.**

Samadzadeh M, Abbasi M, Shahbazzadegan B.

The aim of this study was the comparison of executive function in children with attention deficit hyperactivity disorder and normal children of Arak. The study populations were all the children with ADHD (Attention Deficit/Hyperactivity Disorder) aged 9 to 15 years attending junior high school education center for retarded children and junior high school children who did not have any mental health problems. The sample consisted of 40 male children; 20 with ADHD and 20 randomly selected normal children. For collecting data, Raven's on colored matrices, Connors' rating scale for ADHD, flowers and hearts test, visual research test and Simon's test I, II have been used. For data analysis, MANOVA test and Log research questionnaire test have been used. The results showed that there was significant difference between the executive function of the normal and hyperactive children (p < 0.00). There was also significant difference between the inhibitions function and working memory in hyperactive children as compared to normal children.

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**Asian J Psychiatry. 2011;4:S12.**

**SUMMER TREATMENT PROGRAM FOR CHILDREN WITH ADHD: A JAPANESE EXPERIENCE FOR 6 YEARS.**

Yamashita Y.

**Rationale:** The STP was developed to treat ADHD children's difficulties in peer relationships in an intensive summer experience that focuses on learning sports skills and social skills, improving follow-through with adult requests and commands, as well as improving academic achievement. Positive effects of STP for children with ADHD have been demonstrated in multiple geographic regions of the U.S. and Canada. However, there has never been a STP conducted with a primarily Asian sample.

**Methods:** The collection of evidence-based behavioral modification techniques that comprises the STP's behavioral program (e.g., point system, daily report card, positive reinforcement, time out) was used. STP has been run for 6 times (2005-2010) in an elementary school in Kurume city, Japan. Cognitive changes were evaluated by CogState (registered trademark) batteries.

**Results:** The short-term effect of the 2-3 weeks STP was demonstrated for Japanese children with ADHD. Most children showed positive behavioral changes in multiple domains of functioning, demonstrated by significant improvement in points earned daily, which reflect behavior frequencies. The ADHD rating scale, symptoms of ODD, evaluated by parents significantly improved after STP. Cognitive functions, particularly the rate of anticipatory errors in executive function, significantly improved after the STP. Although the 2-3-week STP was much shorter than most STPs run in the U.S., the program is more intensive than typical outpatient treatment.

**Conclusion:** The STP was useful to improve children's behaviors and some cognitive functions. It promoted collaboration among many professionals from different disciplines, which had been lacking in Japan.

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**Asian J Psychiatry. 2011;4:S12.**

**ADHD AND COMORBID ANXIETY DISORDERS: EMERGING PERSPECTIVES.**

Vance A.

It is well known that ADHD and anxiety disorders have a greater than chance association. However, the nature of this comorbid anxiety, its effects on learning, cognition (for example, attention, memory and working memory) and clinical outcomes before and after puberty in children with ADHD remain unclear. This presentation will examine the influence of anxiety on these aspects of the three main subtypes of ADHD and its effect on them as children move through puberty into adolescence. Future directions will be discussed.
THE 1287 G/A POLYMORPHISM OF THE NOREPINEPHRINE TRANSPORTER GENE (NET) IS INVOLVED IN COMMISSION ERRORS IN KOREAN CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER.

Song DH, Jhung K, Song J, et al.

**Background:** Previous evidence supports the role of noradrenergic systems in ADHD, and norepinephrine transporter (NET) is critical in regulating the noradrenergic system. The present study aimed to investigate the association between NET gene polymorphism and the performance measures of the Continuous Performance Test (CPT) in Korean ADHD children.

**Methods:** Eighty-seven children (mean age = 9.23 ± 1.99 years) with ADHD were recruited from a university hospital. Genotypes of G1287A of the NET gene (SLC6A2) were analyzed. All participants completed the CPT, with performance measures of omission errors, commission errors, reaction time and reaction standardization computed. The relationship between G1287A polymorphisms and CPT performance measures was examined.

**Results:** There were 46 subjects with the G/G genotype, 35 subjects with the G/A genotype and 6 subjects with the A/A genotype. Among the three groups, there were no significant differences in the performance of CPTs. When dichotomized according to whether the subjects have the rare allele or not, subjects with the homozygous G/G genotype showed significantly lower commission errors compared to those without G/G genotypes (by independent T-test, t = -2.18, p = 0.026).

**Discussion:** Our study found a significant association between commission errors of the CPT and the G1287A genotype of the NET gene in Korean ADHD children. These findings suggest a protective role of the G/G genotype of the NET polymorphisms in the deficits of response inhibition in ADHD children.

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INCREASED PERFORMANCE UNCERTAINTY IN CHILDREN WITH ADHD? - ELEVATED POST-IMPERATIVE NEGATIVE VARIATION (PINV) OVER THE VENTROLATERAL PREFRONTAL CORTEX.


We aimed to investigate the influences of attention deficit/hyperactivity disorder (ADHD) on response evaluation, as reflected by the postimperative negative variation (PINV), a slow event-related potential.

**Methods:** We investigated PINV as an indicator of performance uncertainty in an audio-visual contingent negative variation (CNV) paradigm with an interstimulus interval of 3 seconds. A constant, unilateral, quick motor reaction with either the right or the left thumb was required after an auditory forewarned (S1) visual imperative stimulus (S2). We examined 18 ADHD patients (combined or hyperactive-impulsive subtype) aged between 8 and 14 years and an age-, sex and IQ-matched control group of 19 healthy subjects using 64-channel high-density EEG. A first run was recorded drug-free, a second one under methylphenidate (MPH) medication in the ADHD group.

**Results:** We found a significantly increased negativity of the PINV-component over the ventrolateral prefrontal cortex in ADHD children compared to the healthy control group. PINV amplitude was influenced by movement side, most likely due to the slightly more difficult task when left hand responses were required. After the intake of MPH, PINV amplitudes of ADHD children normalized.

**Conclusions:** We conclude that children with ADHD are likely to be more uncertain about the correctness of their performance and interpret the increased PINV as a hint towards compensatory mechanisms for a deficit in the evaluation of contingencies. Further studies are needed to assess the exact extent to which remainders of eye-movement related potentials contribute to PINV amplitude despite the correction for eye-artifacts.

A RANDOMIZED, DOUBLE-BLIND, PLACEBO-CONTROLLED PHASE 2 STUDY OF (ALPHA)4(BETA)2 AGONIST ABT-894 IN ADULTS WITH ADHD.


ABT-894 is a novel 4 2 neuronal nicotinic acetylcholine receptor agonist that displays consistent and robust activity in preclinical models of cognition and is generally well tolerated in healthy adults. Attention-deficit/hyperactivity disorder (ADHD) is characterized by core symptoms of hyperactivity, inattentiveness, and impulsivity, with 15-65% of diagnosed children continuing to experience symptoms into adulthood. There is a need for novel treatments that address the unmet medical need associated with ADHD. A randomized, double-blind, placebo-controlled, 2 period, crossover Phase 2 study was designed to determine the safety and efficacy of ABT-894 and atomoxetine in adults with ADHD. For each dose group, subjects received, in random order, placebo treatment and ABT-894 (1 mg, 2 mg, 4mg PO QD, or 4mg PO BID) or active comparator atomoxetine (40mg PO BID) treatment for 28 days. The washout period between treatment periods was approximately 2 weeks. Subjects were assessed weekly and the primary efficacy variable was the Conners’ Adult ADHD Rating Scale - Investigator Rated (CAARS:Inv) Total score at the final evaluation of each 4-week treatment period. Data were analyzed by analysis of covariance with baseline score from each period as a covariate. An expanded period by period analysis examined the consistency of ABT-894 effects. A total of 238 subjects were assessed for safety endpoints, 236 patients included in the intent-to-treat (ITT) dataset, and 196 included in the completers dataset, which was the pre-specified, primary dataset for efficacy. Administration of 4mg BID ABT-894 resulted in a significant improvement compared with placebo in CAARS:Inv Total score (LS mean(plus or minus)SE = -6.69(plus or minus)2.30, p = 0.003). This effect was similar to atomoxetine treatment (-7.98(plus or minus)2.65, p = 0.002). Results from secondary outcome measures were similar to those for the primary outcome measure. In analysis of Period 1, the response on the CAARS:Inv Total score to 4mg BID ABT-894 was significantly improved vs placebo (p = 0.041). For subjects who received placebo in Period 1 and 4mg BID ABT-894 or atomoxetine in Period 2, the change in CAARS:Inv total score for 4mg BID ABT-894 was equivalent to that of atomoxetine in Period 2. Overall, ABT-894 was well tolerated at all dose levels, and the 4mg BID dose was found to be efficacious compared with placebo and generally well tolerated in this Phase 2 trial in adults with ADHD. Evidence of efficacy for this dose was observed during both periods of this crossover study, suggesting that the results were not biased by carryover effects of the crossover design. A better efficacy and adverse event profile was observed for 4mg BID vs 4mg QD ABT-894, suggesting that consistently higher plasma levels of ABT-894 could improve its therapeutic potential. Further investigation of ABT-894, including doses higher than those tested in the current study, would be needed to determine its potential as a safe and effective treatment for adults with ADHD.

BMC Pediatr. 2011;11.

ATTENTION PROBLEMS AND LANGUAGE DEVELOPMENT IN PRETERM LOW-BIRTH-WEIGHT CHILDREN: CROSS-LAGGED RELATIONS FROM 18 TO 36 MONTHS.


Background: Research has highlighted a series of persistent deficits in cognitive ability in preterm low-birth-weight children. Language and attention problems are among these deficits, although the nature of the relation between attention and language in early development is not well known. This study represents a preliminary attempt to shed light on the relations between attention problems and language development in preterm low-birth-weight children.

Methods: The aim of this study was to analyse reciprocal influences between language and attention problems from 18 to 36 months. We used maternal reports on attention problems and language ability referring to a sample of 1288 premature low-birth-weight infants, collected as part of the Norwegian Mother and Child Cohort Study (MoBa). A sample of children born full-term was used as the control group (N = 37010). Cross-lagged panel analyses were carried out to study reciprocal influences between attention problems and language.

Results: Language ability at 18 months did not significantly predict attention problems at 36 months, adjusting for attention problems at 18 months. Attention problems at 18 months significantly predicted
changes in language ability from 18 to 36 months, pointing to a precursor role of attention in relation to language in children born preterm. Gender, age corrected for prematurity, and mother's education emerged as important covariates.

**Conclusions:** Preliminary evidence was found for a precursor role of early attention problems in relation to language in prematurity. This finding can contribute to a better understanding of the developmental pathways of attention and language and lead to better management of unfavourable outcomes associated with co-morbid attention and language difficulties.

Brain Cogn. 2011.

**ASSOCIATION OF THE DAT1 GENOTYPE WITH INATTENTIVE BEHAVIOR IS MEDIATED BY READING ABILITY IN A GENERAL POPULATION SAMPLE.**

**Cornish KM, Savage R, Hocking DR, et al.**

Attention deficit hyperactivity disorder (ADHD) and reading disability (RD) frequently co-occur in the child population and therefore raise the possibility of shared genetic etiology. We used a quantitative trait loci (QTL) approach to assess the involvement of the dopamine transporter (DAT1) gene polymorphism in mediating reading disability and poor attention in a general population sample of primary school children aged 6-11 years in the UK. The potential confounding effects of IQ and chronological age were also investigated. We found an independent association between the homozygous DAT1 10/10 repeat genotype and RD that was not accounted for by the level of ADHD symptoms. This finding suggests that the DAT1 gene polymorphism may influence a common neural mechanism underlying both reading acquisition and ADHD symptoms.


**THE TREATMENT OF FETISHISM IN AN ADOLESCENT WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER.**

**Chang HL, Chow CC.**

Fetishism is characterized by recurrent, intense sexual fantasy or behavior involving the use of nonliving objects, such as women's undergarments, over a period of at least six months. This disorder occurs mostly in males and usually begins in adolescence. The neurobiological etiologies of fetishism remain unclear, and studies on treatment were limited. We present a 14-year-old boy with attention deficit hyperactivity disorder with fetishistic behavior who was treated successfully with 36 mg extended-release methylphenidate daily and 4 months of cognitive-rational emotive psychotherapy.


**PARENT AND TEACHER SNAP-IV RATINGS OF ATTENTION DEFICIT HYPERACTIVITY DISORDER SYMPTOMS: PSYCHOMETRIC PROPERTIES AND NORMATIVE RATINGS FROM A SCHOOL DISTRICT SAMPLE.**


To examine Swanson, Nolan, and Pelham-IV (SNAP-IV) psychometric properties, parent (N =1,613) and teacher (N =1,205) data were collected from a random elementary school student sample in a longitudinal attention deficit hyperactivity disorder (ADHD) detection study. SNAP-IV reliability was acceptable. Factor structure indicated two ADHD factors and an oppositional defiant disorder (ODD) factor. Parent and teacher scores varied by gender and poverty status (d =.49-.56) but not age; only teacher scores varied by race (d =.25-.55). Screening and diagnostic utility was evaluated with likelihood ratios (LRs) and posttest probabilities. Parent SNAP-IV scores above 1.2 increased probability of concern (LR (greater-than or equal to)10) and above 1.8, of ADHD diagnosis (LR (greater-than or equal to)3). Teacher hyperactivity/impulsivity scores above 1.2 and inattention scores above 1.8 increased probabilities of concern only (LR =4.2 and
Higher teacher scores for African American children and race differences in measurement models require future study.

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COMMUNITY-CLINIC-BASED PARENT INTERVENTION ADDRESSING NONCOMPLIANCE IN CHILDREN WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER.

Canu WH, Bearman SK.

The current study tested whether an abbreviated version of Defiant Children (Barkley, 1987), an efficacious parent training program to address the behavioral noncompliance often associated with disruptive behavior disorders, could be implemented successfully within a community mental health clinic setting by master’s-level therapists. Ethnically and socioeconomically diverse parents of 16 children (ages 4 to 12 years old) completed a 6-session active treatment group emphasizing the use of differential attending skills, effective time-out strategies, and a structured reinforcement schedule to increase child compliance. Pre- and posttreatment measures of attention-deficit/hyperactivity disorder (ADHD), oppositional-defiant disorder (ODD), and conduct disorder (CD) symptom level were administered, as well as a measure tapping the contextual breadth (i.e., number of settings) and severity of disruptive behaviors. Parent satisfaction with the treatment was also assessed. Analyses indicated large treatment effects on all measures except CD behavior. Results are discussed in the context of implementing empirically supported therapies in settings where “treatment as usual” is the norm.

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


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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MAJOR DEPRESSION AND TREATMENT RESPONSE IN ADOLESCENTS WITH ADHD AND SUBSTANCE USE DISORDER.

Warden D, Riggs PD, Min SJ, et al.

Background: Major depressive disorder (MDD) frequently co-occurs in adolescents with substance use disorders (SUDs) and attention deficit hyperactivity disorder (ADHD), but the impact of MDD on substance treatment and ADHD outcomes and implications for clinical practice are unclear.
Methods: Adolescents (n = 303; ages 13-18) meeting DSM-IV criteria for ADHD and SUD were randomized to osmotic release methylphenidate (OROS-MPH) or placebo and 16 weeks of cognitive behavioral therapy (CBT). Adolescents with (n = 38) and without (n = 265) MDD were compared on baseline demographic and clinical characteristics as well as non-nicotine substance use and ADHD treatment outcomes.

Results: Adolescents with MDD reported more non-nicotine substance use days at baseline and continued using more throughout treatment compared to those without MDD (p < 0.0001 based on timeline followback; p < 0.001 based on urine drug screens). There was no difference between adolescents with and without MDD in retention or CBT sessions attended. ADHD symptom severity (based on DSM-IV ADHD rating scale) followed a slightly different course of improvement although with no difference between groups in baseline or 16-week symptom severity or 16-week symptom reduction. There was no difference in days of substance use or ADHD symptom outcomes over time in adolescents with MDD or those without MDD treated with OROS-MPH or placebo. Depressed adolescents were more often female, older, and not court ordered.

Conclusions: These preliminary findings suggest that compared to non-depressed adolescents with ADHD and SUD, those with co-occurring MDD have more severe substance use at baseline and throughout treatment. Such youth may require interventions targeting depression.


DIAGNOSES OF PATIENTS REFERRING TO A CHILD AND ADOLESCENT PSYCHIATRY OUTPATIENT CLINIC.
Durukan I, Karaman D, Kara K, et al.
Objective: The aim of the present study is to identify the diagnoses of patients who referred to a child and adolescent psychiatry outpatient clinic.
Method: Medical records of 538 patients referred to the Children and Adolescent Psychiatry outpatient clinic at Gulhane Military Medical School, between January 2009 and June 2009 were studied retrospectively.
Results: It was found that the patients were mostly male and within 7 to 18 years of age. It was also determined that three quarters of patients had at least one diagnosis and the diagnosis rate in children between the ages of 0-6 was 50 percent. Comorbid diagnoses were found in 13.7 percent of all cases and they were mainly in the attention deficit hyperactivity disorder (ADHD) group. The most common diagnoses were ADHD, generalized anxiety disorder, mental retardation, depression and enuresis, respectively. The most common diagnosis in all age subgroups was ADHD. While the most common diagnoses in boys are ADHD, mental retardation, generalized anxiety disorder, enuresis and depression respectively, they were ADHD, generalized anxiety disorder, depression, mental retardation and enuresis in girls.
Conclusion: To know the most common diagnoses, diagnosis differences within genders and possible diagnoses for certain age groups will be useful for improving child and adolescent psychiatry services.

Early Intervent Psychiatry. 2011.

ADOLESCENT ATTENTION DEFICIT HYPERACTIVITY DISORDER AND SUSCEPTIBILITY TO PSYCHOSIS IN ADULTHOOD: A REVIEW OF THE LITERATURE AND A PHENOMENOLOGICAL CASE REPORT.
Jandl M, Steyer J, Kaschka WP

In contrast to affective disorders, some forms of personality disorders and drug addiction, schizophrenia is commonly not considered to be a sequel of attention deficit hyperactivity disorder. However, attention deficit hyperactivity disorder and the prodromal stages of schizophrenia spectrum disorders do exhibit a number of common central features. To facilitate the early treatment of schizophrenic symptoms, the detection of discrete and subtle alterations in the prodromal stages of incipient psychoses is particularly important. Methods: We review the literature on the prodromal symptoms of psychosis and present a case report, in which a phenomenological approach was used to identify subtle alterations linked to anomalous self-experience. Results: Using the Examination of Anomalous Self-Experience symptom checklist, the case report presented here reveals attention deficit hyperactivity disorder symptoms in adolescence as a precursor state of psychosis in adulthood. Conclusions: The characteristics of this schizophrenia spectrum disorder case and its time course are derived from the specific distribution pattern of Examination of
Anomalous Self-Experience items. When treating adolescent attention deficit hyperactivity disorder patients, the rare possibility of the development of schizophrenia spectrum disorder from attention deficit hyperactivity disorder like symptoms should be kept in mind.

Epilepsia. 2011;52:123.

**EPILEPSY AND ADHD IN CHILDREN: PSYCHOSOCIAL ASPECTS AND BEHAVIOR PROBLEMS.**

*Duran MHC, Neri ML, Medeiros LL, et al.*

**Purpose:** Attention deficit and hyperactivity disorder (ADHD) occurs in 13-31% of all children with epilepsy. The incidence of the ADHD in patients with epilepsy, and the correlation with psychosocial aspects and behavior problems are not completely clear. The aim of this study was to verify psychosocial aspects and behavior problems in a group of patients with epilepsy and ADHD.

**Method:** This was a transversal study. Eighty-five patients (ages ranging from 6 to 16 years old) were interviewed with a structured questionnaire. Sixty patients were diagnosed with epilepsy with presumably genetic etiology without encephalopathy (group I) and 25 patients were diagnosed with epilepsy with structural/metabolic etiology (group II). All patients of group I had normal MRI. We used the MTASNAP IV Teacher and Parent Rating Scale, Vineland Adaptive Behavior Scales and the Conner's Rating Scales - Revised. No patients had IQ scores under 79.

**Result:** ADHD occurred in 8/60 patients of group I (13%) and in 12/25 patients of group II (48%). ADHD was significantly more frequent in patients of group II than patients of group I (p = 0.02). Patients with ADHD in group II had significantly more seizures (p = 0.01), not well controlled (p = 0.025), and lower scores (p = 0.036) in Vineland Scales (communication domain) than patients in group I.

**Conclusion:** The incidence of ADHD is higher in patients with determined etiology when compared with patients with genetic etiology. Our data showed that psychosocial aspects and behavior problems follow the same rule.


**DOES COGNITIVE FUNCTIONING INFLUENCE EPILEPSY OCCURRENCE IN CHILDREN DIAGNOSED WITH ADHD BY THE TIME OF ADHD ASSESSMENT?**

*Einarsdottir S, Lorange M, Socanski D.*

**Purpose:** To investigate the cognitive functioning influence of epilepsy in children with attention deficit/hyperactivity disorder (ADHD) by the time of ADHD assessment. The cognitive levels, the intelligence quotient (IQ) were examined and compared in patients with and without previous history of epileptic seizures (ESz).

**Method:** Subjects were 607 (82.4% male), aged between 5 and 14 years, mean 9.4 ± 2.5, who were diagnosed at our Hospital between January 2000 and December 2005. A previous history of ESz had 14 patients. Cognitive evaluation was made by means of the Wechsler Intelligence Scale for Children-Revised, the Norwegian version. All children were divided in two groups: normal cases with IQ >85 and mentally delayed cases with IQ <85 (including patients with mild mental retardation IQ<70, and borderline intelligence patients IQ <70 but <80).

**Results:** History of epilepsy was found in 14 (2.3%) children. Cognitive testing results were obtained from 549 patients (all 14 patients with and 535 without epilepsy). Of these with a history of ESz, 35.7% had IQ <85, and of those without ESz, 24.3% had IQ <85. When we excluded the patients with IQ <85, we found lower rate of epilepsy 1.9%, still different from the general population (1%).

**Conclusion:** A higher rate of epilepsy in children with ADHD was associated with lower IQ level of these patients. Excluding these cases, the epilepsy occurrence was still different. Children with ADHD had more often epilepsy than expected in the general population regardless of the lower cognitive functioning in some patients.
**Efficacy and Safety of Methylphenidate in Treating ADHD Symptoms in Children and Adolescents with Uncontrolled Seizures: A Brazilian Sample Study and Literature Review.**  
Koneski JAS, Casella EB, Agertt F, et al.  
**Objective:** Attention-deficit/hyperactivity disorder (ADHD) is observed in 30% of children and adolescents with epilepsy. Recent studies have demonstrated the safety of methylphenidate (MPH) in patients with controlled epilepsy. There are few studies of patients with uncontrolled epilepsy. The goal was to study the efficacy and safety of MPH use in children and adolescents diagnosed with ADHD and uncontrolled epilepsy.  
**Methods:** We evaluated 24 patients ranging from 7 to 16 years of age who took MPH for 6 months. Inclusion criteria were at least two epileptic seizures in the previous 6 months and a diagnosis of ADHD based on DSMIV criteria.  
**Conclusion:** Patients were classified according to ADHD subtype as follows: 41.7% inattentive type, 37.5% combined, and 20.8% hyperactive/impulsive type; 58.3% had partial epilepsy and 41.7% generalized epilepsy. There was an overall improvement in ADHD symptoms in 70.8% of patients, and there was no increase in frequency of epileptic seizures in 22 patients (91.6%).

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**Diurnal Variations in Arousal: A Naturalistic Heart Rate Study in Children with ADHD.**  
Previous studies suggest an altered circadian regulation of arousal in children with attention-deficit hyperactivity disorder (ADHD) as measured by activity, circadian preference, and sleep-wake patterns. Although heart rate is an important measure to evaluate arousal profiles, to date it is unknown whether 24-h heart rate patterns differentiate between children with and without ADHD. In this study, 24-h heart rate data were collected in 30 non-medicated children with ADHD (aged 6-11) and 30 sex-, class-, and age-matched normal controls in their naturalistic home and school setting, during 5 days. Simultaneously, 24-h activity patterns were registered. Confounding effects of demographic variables (e.g., age, sex, BMI, pubertal stage) and comorbid internalizing and externalizing problems on heart rate levels were additionally assessed. Longitudinal analysis showed that heart rate levels were overall higher in the ADHD group (p < 0.01)-with the largest effects during afternoon and night-in a model controlling for age. Other factors did not significantly contribute to variations in heart rate levels. Compared to controls, children with ADHD showed higher activity levels during daytime (especially early afternoon), but not during nighttime (p < 0.05). Post hoc analyses showed that environmental effects might influence daytime variations. Findings suggest an autonomic imbalance in children with ADHD as compared to controls, with higher heart rate levels in the ADHD group. Nighttime tachycardia in this group could not be explained by nighttime activity levels or comorbid externalizing/internalizing problems. Further research on autonomic functioning in ADHD is recommended because of the major impact of higher resting heart rate on health outcomes.

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**Editorial: Observational Studies in ADHD: The Effects of Switching to Modified-Release Methylphenidate Preparations on Clinical Outcomes and Adherence.**  
Rothenberger A, Dopfner M.  
Patients with ADHD may have better adherence to treatment with modified-release methylphenidate (MPH-MR) formulations, which are taken once daily, compared with immediate-release (IR) formulations, which need to be taken several times a day. Data on long-term outcomes such as adherence may be lacking from randomised controlled trials as these are usually only short-term. Observational studies, if performed and reported appropriately, can provide valuable long-term data on such outcomes, as well as additional information on effectiveness and efficiency, from a real-life setting. By reviewing previous observational studies that have investigated switching treatment from MPH-IR to MPH-MR, results from a new,
naturalistic observational study, the OBSEER study, are put into context. We conclude that, based on observational trial data, switching from MPH-IR to MPH-MR is a valid clinical approach, with the potential for improved clinical outcome and treatment adherence.

**AN OBSERVATIONAL STUDY OF ONCE-DAILY MODIFIED-RELEASE METHYLPHENIDATE IN ADHD: EFFECTIVENESS ON SYMPTOMS AND IMPAIRMENT, AND SAFETY.**

ADHD affects over 5% of children worldwide. It is typically treated with stimulant medications, and methylphenidate (MPH) is the most commonly prescribed. This study investigated the effectiveness, on symptoms and impairment, and safety of Equasym XL (registered trademark), a combination of 30% immediate-release and 70% modified-release MPH, in the treatment of ADHD in daily clinical practice. This open-label, observational, post-marketing surveillance study was conducted in 169 centres in Germany. Eligible patients, aged 6-17 years, were diagnosed with ADHD and about to begin treatment with Equasym XL (registered trademark). Effectiveness was assessed by physicians using the clinical global impression (CGI) severity and improvement scales; teachers and parents completed questionnaires evaluating ADHD symptoms and behavioural problems (DAYAS, FBB-ADHD and SDQ-P). Assessments were carried out at baseline, after 1-3 and 6-12 weeks of treatment. Of 852 enrolled patients, 822 were evaluable; 25.30% were treatment naive, 69.84% had previously received different MPH formulations, and 4.87% had received other medications. ADHD symptoms improved from baseline to last visit for the majority of patients for all outcome measures. According to physician ratings of core ADHD symptoms, 75.73% of patients showed improvements on the CGI-Improvement scale, 17.77% had no change, and 6.50% worsened. In teacher and parent ratings, the effectiveness of Equasym XL (registered trademark) was rated better than prior therapy at all measured time points across the day, particularly late morning (teachers) and early afternoon (parents). Equasym XL (registered trademark) was generally well tolerated; only 3.16% of patients permanently discontinued treatment due to adverse events. Equasym XL (registered trademark) is effective and well tolerated in daily clinical practice.

Eur Child Adolesc Psychiatry. 2011;20:S120.
**USE OF BALL BLANKET IN ATTENTION DEFICIT HYPERACTIVITY DISORDER SLEEPING PROBLEMS.**
Hvolby A, Bilenberg N.

**Introduction**: Sleep deprivation in children with ADHD is a common reported complain. We know that sleep difficulties with no explanatory cause can be mistaken for ADHD, and that the kind of symptoms observed in primary sleep disorders - such as sleep-related breathing disorders - can often be mistaken for ADHD as they are very similar to core symptoms of ADHD.

**Objectives**: Based on actigraphic surveillance, ADHD symptom rating and sleep diary, this study will evaluate the effect of ball blanket on sleep for a sample of 8-13 years old children with ADHD

**Design**: Case-control study. Setting: A child and adolescent psychiatric department of a teaching hospital.

**Participants**: 21 children aged 8-13 years with a diagnosis of ADHD and 21 healthy control subjects.

**Intervention**: Sleep was monitored by parent-completed sleep diaries and 28 nights of actigraphy. For 14 of those days, the child slept with a ball blanket.

**Results**: The time it takes to fall asleep when using the ball blanket is shortened and found to be at the same level as the healthy control subjects. Furthermore, we found that the use of ball blankets significantly reduced the number of nights that the ADHD child spends more than 30 min falling asleep from 19 to 0%. Teacher rating of symptoms showed an improvement in both activity levels and attention span of approx. 10% after using the ball blankets.
Discussion/conclusions: Use of ball blankets is a relevant and effective treatment method with regard to minimising sleep onset latency. We found that the use of Ball Blankets for 14 days improved not only sleep onset problems but also improved the daytime functioning in children with ADHD.

WHAT CONTRIBUTES TO PATIENT AND PARENT SATISFACTION WITH MEDICATION IN THE TREATMENT OF CHILDREN WITH ADHD? A REPORT ON THE DEVELOPMENT OF A NEW RATING SCALE.
Satisfaction with medication is important in the evaluation of overall treatment outcome. There is a lack of consistent and validated rating scales for satisfaction with medication in ADHD, therefore comparison across studies is difficult. Here, we analyse the psychometric properties of the satisfaction with medication scale (SAMS), a new item-based questionnaire that assesses satisfaction with ADHD medication. Furthermore, we evaluate the predictive effect of ADHD symptoms and quality of life (QoL) on satisfaction. Data on satisfaction with Equasym XL (registered trademark) (methylphenidate) were collected in the OBSEER study using the parent (SAMS-P, n = 589) and patient (SAMS-S, n = 552) versions of the SAMS questionnaire. Internal consistency, item-total and cross-informant correlations, and the stability of satisfaction ratings over time were assessed. Satisfaction with medication scores were then correlated with ratings of ADHD symptoms and QoL. Rates of overall satisfaction with Equasym XL (registered trademark) among parents and children were high (>70%), as was internal consistency for both SAMS-P and SAMS-S (Cronbach's alpha > 0.9). Similarly, item-total correlations were high (r = 0.71-0.90) for SAMS-P and medium-high (r = 0.57-0.77) for SAMS-S. Cross-informant correlations and the stability of satisfaction ratings were moderate (r = 0.54-0.59 and 0.48-0.60, respectively). ADHD symptom and QoL ratings were significantly negative and positive predictors of satisfaction, explaining 36-52% of satisfaction variance at the final visit. The results show that parent and patient satisfaction was high and could be assessed reliably with the new SAMS questionnaire. Parent and patient ratings were moderately correlated, and symptom severity, functional impairment and QoL were the most significant predictors of satisfaction.

AN OBSERVATIONAL STUDY OF ONCE-DAILY MODIFIED-RELEASE METHYLPHENIDATE IN ADHD: QUALITY OF LIFE, SATISFACTION WITH TREATMENT AND ADHERENCE.
Rothenberger A, Becker A, Breuer D, et al.
Attention deficit hyperactivity disorder (ADHD) impacts significantly on the quality of life (QoL) of patients and their families. Choice of therapy is increasingly influenced by treatment satisfaction and patient preference, with once-daily modified-release methylphenidate (MPH-MR) formulations offering clear benefits compared with immediate-release (IR) dosage forms. The effects of MPH-MR on QoL in ADHD have not been widely investigated and need more clarity in practice. The open-label OBSEER study evaluated the effectiveness and tolerability of Equasym XL (registered trademark), a MPH-MR formulation, in routine practice. Children and adolescents (aged 6-17 years) with ADHD and attending school were included if Equasym XL (registered trademark) treatment was planned by the treating physician. Physicians, parents and patients completed questionnaires assessing QoL (KINDL; parent, child or adolescent versions), satisfaction with medication, adherence and treatment tolerability at baseline (Visit 1), 1-3 weeks (Visit 2) and 6-12 weeks (Visit 3) over a maximum 3-month observation period. Data from 822 consecutively referred patients were analysed. QoL and medication satisfaction increased from Visit 1 to Visit 3, with both parents and patients rating therapy with Equasym XL (registered trademark) as better than previous drug therapy. KINDL total score effect sizes were 0.67 (parents' ratings), 0.52 (children's ratings) and 0.51 (adolescents' ratings; all p < 0.001). All KINDL subscores also increased: both parents and patients had the greatest improvement for school. Adherence to Equasym XL (registered trademark) was frequently rated as superior to prior treatment, particularly compared with MPH-IR repeated dosing. Treatment was generally well tolerated; approximately 3% of the patients discontinued treatment due to
adverse events. Equasym XL (registered trademark) improved QoL compared with prior therapy, and resulted in good medication satisfaction and adherence in drug-naive and previously treated patients.

**TRAJECTORIES OF CBCL ATTENTION PROBLEMS IN CHILDHOOD.**

**Robbers SCC, Van Oort FVA, Polderman TJC, et al.**
The first aim of this study was to identify developmental trajectories of Attention Problems in twins followed from age 6 to 12 years. Second, we investigated whether singletons follow similar trajectories. Maternal longitudinal ratings on the Attention Problems (AP) subscale of the Child Behavior Checklist were obtained for a sample of 12,486 twins from the Netherlands Twin Register and for a general population sample of 1,346 singletons. Trajectories were analyzed by growth mixture modeling in twins, and compared with singletons. Teacher ratings on the AP subscale of the Teachers’ Report Form were available for 7,179 twins and 1,211 singletons, and were used for cross-sectional mean comparisons at each age. All analyses were conducted for boys and girls separately. We identified three linear trajectories in both boys and girls, i.e., stable low (62-71%), low-increasing (15-18%), and high-decreasing (14-21%). Singletons followed three identical trajectories, with similar class proportions. Teacher ratings yielded no differences in mean levels of Attention Problems between twins and singletons. The development of Attention Problems from age 6 to 12 years can be characterized by stable low, low-increasing, and high-decreasing developmental trajectories. Twins and singletons are comparable with respect to the development of Attention Problems in childhood.

**AN OBSERVATIONAL STUDY OF ONCE-DAILY MODIFIED-RELEASE METHYLPHENIDATE IN ADHD: THE EFFECT OF PREVIOUS TREATMENT ON ADHD SYMPTOMS, OTHER EXTERNALISING SYMPTOMS AND QUALITY-OF-LIFE OUTCOMES.**

**Dopfner M, Breuer D, Walter D, et al.**
Methylphenidate (MPH) is the most commonly prescribed stimulant for children with ADHD. Data on the effects of different MPH formulations in real-life settings are scarce, and the role of previous therapy on treatment outcome when switching medications has not been well studied. OBSEER was an observational study designed to evaluate the effectiveness and safety of Equasym XL (registered trademark) in routine care. This study assessed whether the improvements reported with Equasym XL (registered trademark) are influenced by the degree of symptom control achieved with the previous medication. Patients enrolled in OBSEER were stratified by prior treatment (none, MPH-immediate release [IR] once daily [o.d.] [MPH-IR o.d.], MPH-IR repeated [MPH-IR >o.d.] and MPH-MR [modified release] excluding Equasym XL [registered trademark]), and changes in ADHD and other externalising symptoms (CGI-S, FBB-ADHD and DAYAS) and quality of life (QoL, KINDL) were evaluated during treatment with Equasym XL (registered trademark). A total of 782 patients were analysed. Significant group-by-time interactions were found for all symptom variables analysed, indicating that effects varied by previous medication. For CGI-S and FBB-ADHD total scores, the greatest reductions in ADHD symptoms were observed in the treatment-naive subgroup, followed (in order) by MPH-IR o.d., MPH-IR >o.d. and MPH-MR. A similar profile was seen for DAYAS ratings for all periods of the day except the evening, when there were no significant differences between subgroups. Similarly, the treatment-naive and MPH-IR o.d. subgroups showed the greatest improvements in KINDL ratings. Although effects were greatest for treatment-naive patients, improvements were also observed in the prior treatment subgroups for symptoms and QoL. This suggests that a change to Equasym XL (registered trademark) may be beneficial in patients with suboptimal effects on prior medication.
RELATIONSHIP BETWEEN QUALITY OF LIFE AND PSYCHOPATHOLOGICAL PROFILE: DATA FROM AN OBSERVATIONAL STUDY IN CHILDREN WITH ADHD

Although ADHD significantly affects the quality of life (QoL) of patients and their families, QoL in children with ADHD has rarely been investigated in association with psychopathological profile, and the relationship remains unclear. The open-label OBSEER study evaluated the effectiveness and tolerability of Equasym XL (registered trademark), a modified-release methylphenidate, in routine care of children and adolescents (aged 6-17 years) with ADHD. At baseline, questionnaires assessing psychopathological profile (Strengths and Difficulties Questionnaire, SDQ; parental ratings) and QoL (KINDL; parent, child or adolescent versions) were completed; QoL was reassessed at final visit. We analysed the relationship between psychopathology and parent/patient-rated QoL in ADHD at baseline. Data from 721 consecutively referred children and adolescents were analysed. QoL was similarly low from parent and self-ratings and independent of severity on the SDQ subscale hyperactivity/inattention. Self-ratings indicated that additional conduct disorder was associated with further reduction in QoL. Similarly, children with high scores from parent and adolescent ratings on the SDQ subscale conduct problems had reduced QoL on some KINDL subscales. Adolescents with ADHD not receiving medication at baseline reported lower QoL than those already on medication. Results show that children and adolescents with ADHD have low QoL, independent of core symptom severity. Additional conduct problems may further impact QoL negatively, while ADHD medication use may show a trend towards improved QoL. Not all psychopathological problems associated with ADHD affect QoL similarly. As parents appear to have a less critical view of QoL compared with children's self-ratings, both parent and child ratings should be included in clinical assessments.

ATTENTION BEHAVIOR AND HYPERACTIVITY AND CONCURRENT NEUROCOGNITIVE AND SOCIAL COMPETENCE FUNCTIONING IN 4-YEAR-OLDS FROM TWO POPULATION-BASED BIRTH COHORTS.

Objective: We studied the associations between Attention Deficit Hyperactivity Disorder (ADHD) symptoms and the neurobehavioral status in two population-based birth cohorts.

Methods: Children (n=467) were assessed by psychologists and teachers for neuropsychological functioning (McCarthy Scales, MCSA), inattention-hyperactivity symptoms (ADHD-DSM-IV form list) and social behavior (California Preschool Social Competence Scale, CPSCS). Regression models were used with covariate adjustment.

Results: Sixteen percent of children had ADHD-DSM-IV symptoms. MCSA scores were linearly associated with ADHD symptom scores (general cognitive Beta. =-0.6 [-1.0; -0.3] per symptom), specifically inattention scores (general cognitive Beta. =-1.8 [-2.3; -1.2]). CPSCS scores were associated with ADHD symptoms (Beta. =-2.19 [-2.5; -1.9]). MCSA scores of executive function, perceptive-performance and quantitative sub-areas had stronger associations with ADHD symptoms.

Conclusions: Preschooler ADHD symptoms are associated with concurrent decrements in neurocognitive and social competence functioning. The association patterns are similar to those found in older children with ADHD symptomology (Marks et al., 2005 [36], Seidman, 2006 [46], Sonuga-Barke et al., 2003 [48], Yochman et al., 2006 [53]).

TRAINING-INDUCED NEUROANATOMICAL PLASTICITY IN ADHD: A TENSOR-BASED MORPHOMETRIC STUDY.

Experience-based neuroplasticity has typically been associated with functional changes, but growing evidence indicates that training can also render dynamic structural alterations in the brain. Although research on training-induced morphological plasticity has consistently demonstrated rapid increases of gray matter volume in task-related regions, no studies have examined if local volumetric reductions in gray
matter associated with certain psychiatric disorders may be reversible by adequate training. We aimed to assess whether a training program applied to ADHD patients can contravene some of the associated neuroanatomical alterations. High-resolution anatomical scans were acquired before and after the training period, and a whole-brain tensor-based morphometric approach was applied to extract a voxel-wise estimation of longitudinal changes in regional gray matter volume. Our results show focal volumetric gray matter increases in bilateral middle frontal cortex and right inferior-posterior cerebellum after cognitive training compared with the ADHD control group. The extent of gray matter volume increase in the inferior-posterior cerebellum was associated with attentional performance. These findings illustrate the capacity of the nervous system for rapid morphological adjustments in response to environmental triggers. Moreover, the dorsolateral prefrontal cortex and cerebellum are commonly considered sites of volumetric reduction in ADHD, and the inferior-posterior lobule of the cerebellum is associated with progressive symptom-related volume loss. Hence, the clusters of volumetric change observed in our study were confined to structures typically characterized by volume reduction in ADHD patients, providing preliminary indications that cognitive training may contravene some of the neuroanatomical deficits associated with the disorder.


FUNCTIONAL MAGNETIC RESONANCE IMAGING OF FACIAL INFORMATION PROCESSING IN CHILDREN WITH AUTISTIC DISORDER, ATTENTION DEFICIT HYPERACTIVITY DISORDER AND TYPICALLY DEVELOPING CONTROLS.


The present study used functional magnetic resonance imaging (fMRI) to compare the neural activation patterns of children diagnosed with autistic disorder (AD), attention deficit hyperactivity disorder (ADHD), and typically developing controls (TCs) in response to a task involving evaluation of facial expressions. Substantially greater functional activity was noted in TCs compared to both subjects diagnosed with AD and ADHD. Consistent with previous studies, differences in functional activation of the amygdala, fusiform gyrus, cerebellum, mesolimbic, and temporal lobe cortical regions of the brain during a task evaluating facial expressions were noted in AD compared to TCs. Differences in the neural activity in these brain regions were also observed in children diagnosed with AD compared to those diagnosed with ADHD. Overall decreased neural activity was observed during the faces task performance in the AD group compared to the other two groups, a finding consistent with studies using adults. Both TC and ADHD control groups showed increased inferior frontal cortex activity compared to the AD group. Significant activity was present in both TC and ADHD control groups in the insula which was absent in the AD group; this is consistent with other studies showing dysfunction of the mesolimbic system in children with AD. Although frontostriatal and mesolimbic systems appear to be affected in AD, these deficits were not in the same attentional networks which are dysfunctional in children diagnosed with ADHD.


ANTHROPOSOPHIC THERAPY FOR ATTENTION DEFICIT HYPERACTIVITY: A TWO-YEAR PROSPECTIVE STUDY IN OUTPATIENTS.


Background: Anthroposophic treatment for attention deficit hyperactivity disorder (ADHD) includes special artistic and physical therapies and special medications.

Methods: We studied 61 consecutive children starting anthroposophic treatment for ADHD symptoms under routine outpatient conditions. Primary outcome was FBB-HKS (a parents’ questionnaire for ADHD core symptoms, 0-3), and secondary outcomes were disease and symptom scores (physicians’ and parents’ assessment, 0-10) and quality of life (KINDL (registered trademark) total score, 0-100).

Results: A total of 67% of patients fulfilled the DSM-IV criteria for ADHD, 15% had an exclusion diagnosis such as pervasive developmental disorders, while 18% did not fulfill ADHD criteria for another reason. Anthroposophic treatment modalities used were eurythmy therapy (in 56% of patients), art therapy (20%), rhythmical massage therapy (8%), and medications (51%). From baseline to six-month follow-up, all outcomes improved significantly; average improvements were FBB-HKS total score 0.30 points (95%
confidence interval [CI]: 0.18-0.43; P < 0.001), FBB-HKS inattention 0.36 (95% CI: 0.21-0.50; P < 0.001), FBB-HKS hyperactivity 0.29 (95% CI: 0.14-0.44; P < 0.001), FBB-HKS impulsivity 0.22 (95% CI: 0.03-0.40; P < 0.001), disease score 2.33 (95% CI: 1.84-2.82; P < 0.001), symptom score 1.66 (95% CI: 1.17-2.16; P < 0.001), and KINDL 5.37 (95% CI: 2.27-8.47; P= 0.001). Improvements were similar in patients not using stimulants (90% of patients at months 0-6) and were maintained until last follow-up after 24 months.

**Conclusion:** Children with ADHD symptoms receiving anthroposophic treatment had long-term improvement of symptoms and quality of life.

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**Iran J Kidney Dis. 2011;5:14.**

**Correlation between nocturia and attention deficit / Hyperactivity disorder in children with nocturia. Yousefi Chaian P.**

**Introduction.** Attention Deficit Hyperactivity Disorder is the most common childhood neuralgic behavioral disorder which affects 5 to 10% of children in school age. It seems that the disorder is more common among children with nocturia. The aim of this study was to investigate ADHD in children with nocturia and compare it with a control group in patients referred to Amir Kabir hospital of Arak.

**Methods.** This case control study was performed on 100 children with nocturia and 100 children without nocturia in the age period of 5 to 16 year old. In all patients, questionnaire based on DSM IV (ADHD) as well as an information list about age, gender, history of maternal disease during pregnancy, birth weight and head trauma, was filled and the patients were interviewed. The data were analyzed using qualitative variables and chi-square test.

**Results.** Among 100 patients with nocturia, 16 cases (16%) showed attention deficit while this figure was 5 cases (5%) in the control group which showed a significant difference. (P = 0.01). Also in the patients group; 25 children (25%) were affected by hyperactivity - impulsive behavior while only 16 (16%) children were affected by this behavior in the control group which was important but didn't show any significant difference (P = 0.08).

**Conclusion.** ADHD in children with enuresis is significantly more common than non-neurotic children and makes psychological consult mandatory in children with enuresis and absolute attention to drug prescription in these patients is necessary.

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**Pharmacokinetics and therapeutic effect of OROS® methylphenidate under different breakfast conditions in children with attention-deficit/hyperactivity disorder. Wigal SB, Gupta S, Heverin E, et al.**

**Objective:** To examine the pharmacokinetics (PKs) and pharmacodynamics (PDs) of OROS® methylphenidate (OROS MPH) dosed once daily (QD) versus an early standard regimen (immediate-release [IR] MPH dosed three times daily [TID]) under various breakfast conditions.

**Methods:** This single-center, double-blind, double-dummy, randomized, crossover study of OROS MPH (NCT00269815) in children aged 6 to 12 years with attention-deficit/hyperactivity disorder evaluated the PKs and PDs of MPH given with different breakfast conditions: OROS MPH administered after a high-fat breakfast, after a normal breakfast, or after fasting and IR MPH administered after a normal breakfast or after fasting in the morning and at two subsequent time points during the day. To maximize information, patients were divided into two groups, each receiving three of the five treatments for 1 day in a three-period, randomized, crossover design. Patients were assigned to 1 of 3 dosage levels (OROS MPH 18, 36, and 54 mg QD, and an assumed equivalent regimen of IR MPH 5, 10, and 15 mg given TID) based on their prestudy established clinical dose of IR MPH. PD measurements included Combined-Attention and Deportment scores on a rating scale of school behavior (the Swanson, Kotkin, Agler, M-Flynn, and Pelham), global assessments of efficacy, and activity monitor levels during academic seatwork. Serial blood samples for PK analysis were taken predose, and then every 60 to 90 minutes until 11.5 hours postdose. Vital signs were assessed predose, and then every 1.5 to 2.5 hours until 11.5 hours postdose.
Results: Of the 32 patients enrolled, 31 completed the study. The PK profiles for MPH after OROS MPH administration were similar under all conditions (with normal, high-fat breakfast, or fasting). No bioequivalence tests of OROS MPH and IR MPH under various breakfast conditions were done because there were so few patients in each dose level of treatment. The two IR MPH conditions (after normal breakfast and fasting) were not compared. The drug-to-metabolite ratios (area under the curve) for all OROS MPH and IR MPH treatments were similar. OROS MPH and IR MPH provided a similar therapeutic effect, irrespective of breakfast conditions, as demonstrated by the Swanson, Kotkin, Agler, M-Flynn, and Pelham Attention and Deportment measures and global assessments. No serious adverse events, no deaths, and no clinically significant changes in vital signs were reported, except for one patient who was discontinued early because of repeated systolic blood pressure elevations on study day 1.

Conclusions: The results of this study demonstrate that in children with attention-deficit/hyperactivity disorder, administering OROS MPH with or without food produces similar PK and PD profiles.


THE IMPACT OF CONDUCT DISORDER AND STIMULANT MEDICATION ON LATER SUBSTANCE USE IN AN ETHNICALLY DIVERSE SAMPLE OF INDIVIDUALS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER IN CHILDHOOD.


Objective: To examine late adolescent substance use outcomes in relation to childhood conduct disorder (CD) and psychostimulant treatment in urban youth found to have attention-deficit/hyperactivity disorder (ADHD) in childhood.

Methods: Ninety-seven adolescents, evaluated during childhood, were seen for follow-up on average 9.30 (SD = 1.65) years later along with a well-matched never-ADHD control group. Stimulant treatment history was coded: Never (n = 28), up to 1 year (n = 19), 1 to 5 years (n = 28), and greater than 5 years (n = 22). Substance use at outcome was coded dimensionally for severity (frequency/intensity) and categorically for substance use disorders (SUDs).

Results: Individuals with ADHD+CD in childhood had significantly higher rates of SUD and substance use severity than those with childhood ADHD and controls. The ADHD and control groups did not differ significantly. Among those with childhood ADHD, there were no significant differences in SUD status or substance use severity as a function of medication history.

Conclusions: Within an ethnically diverse urban sample, the increased rate of substance use associated with ADHD was fully accounted for by the presence of CD. These results extend previous findings indicating little impact of psychostimulant treatment on later substance use to an ethnically diverse urban sample and to individuals who received treatment for up to 12 years.


AN ADOLESCENT WITH KLEPTOMANIA AND ATTENTION-DEFICIT/HYPERACTIVITY DISORDER TREATED WITH METHYLPHENIDATE.

Herguner S, Tanidir C.

PRESCHOOL ONSET ATTENTION-DEFICIT/HYPERACTIVITY DISORDER: COURSE AND PREDICTORS OF STABILITY OVER 24 MONTHS.

Tandon M, Si X, Luby J.

Objective: The present study examined the course of ADHD over 24 months in a preschool population.

Method: n=48 preschoolers with ADHD, aged 3.0-5.11 years, subjects included in a larger sample of preschoolers with depression and other disorders (n=306) were comprehensively assessed at 3 annual time points over 24 months in a prospective longitudinal follow-up study.
Results: Baseline diagnoses of preschool MDD, ODD, and CD were risk factors for ADHD diagnosis over 24 months in this preschool population. Among older preschoolers and after controlling for key demographic variables, ADHD predicted later ADHD diagnosis, along with other significant risk factors - baseline diagnosis of ODD, and/or family history of disruptive disorders, and stressful life events.

Conclusions: ADHD showed greater homotypic continuity at later rather than earlier preschool ages. Other disruptive comorbidities also emerged as key predictors of stable ADHD course. Study findings may help to inform which preschool ADHD populations to target for early intervention. Larger sample sizes are needed to confirm these findings and to further explore the stability, course, and predictors of outcome of preschool onset ADHD.


CORRELATION BETWEEN EEG ACTIVITY AND BEHAVIOR IN CHILDREN WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER.
Clarke AR, Barry RJ, McCarthy R, et al.
The aim of this study was to determine whether EEG activity in specific bands correlated with the core behavioral symptoms of children with attention-deficit/hyperactivity disorder (AD/HD). Sixty boys diagnosed with AD/HD Combined type and 60 age-matched male controls participated in this study. An EEG was recorded during an eyes-closed resting condition and relative power estimates in the delta, theta, alpha, and beta bands, and the theta/beta ratio, were calculated. The EEG measures of the AD/HD group were converted to z scores relative to the controls, and these were correlated with scores on the Conners' Rating Scale obtained from a parent. The AD/HD group had global increases in theta activity and the theta/beta ratio, increased frontal delta, with reduced global alpha and frontal beta activity. Frontal theta activity correlated with inattention, the theta/beta ratio correlated with hyperactivity-impulsivity, and both measures correlated with a Combined type diagnosis. EEG power anomalies in AD/HD are associated with specific symptom clusters in the disorder.


ADHERENCE TO MEDICATION FOR ATTENTION DEFICIT/HYPERACTIVITY DISORDER: DOES TIME FRAME MATTER?
Khoza S, Oladapo AO, Barner JC.
Objectives: Attention deficit/hyperactivity disorder (AD/HD) medication users frequently take 'drug holidays' during the summer months. The study objective was to compare ADHD medication adherence for the school year (SY, 270 days) and for the entire year (EY, 365 days) by medication type, medication class and duration of action.

Methods: Continuously enrolled Texas Medicaid children ((less-than or equal to)18 years) who had two or more prescription claims for an ADHD medication served as the study population. SY (1 September-31 May) and EY (1 January-31 December) prescription claims were extracted from July 2002 to December 2008.

Key findings: Overall mean ((plus or minus)SD) adherence for SY (n=50842) and EY (n=62789) time frames was 62.2% ((plus or minus)26.2%) and 49.8% ((plus or minus)30.3%), respectively. The overall frequency of patients who were adherent (medication possession ratio, (greater-than or equal to)80%) was higher during SY (28.3%) than during EY (22.1%). Regarding medication type, mean adherence for immediate-release stimulants (52.8 versus 37.2%), extended-release stimulants (63.7 versus 52.1%), pro-drug stimulants (63.5 versus 47.6%) and non-stimulants (62.9 versus 52.5%) was higher during SY than EY, respectively. Regarding medication class, mean adherence for stimulants (62.1 versus 49.4%) and non-stimulants (62.9 versus 52.5%) was higher during SY than EY. Similarly, regarding duration of action, mean adherence for short-acting agents (52.2 versus 37.2%) and long-acting agents (63.4 versus 52.2%) was higher during SY than EY, respectively.

Conclusions: Patients were more adherent during the SY compared to the EY. Due to unique patient medication-taking behaviors, ADHD medication adherence differs depending on the time frame used.
CARDIOVASCULAR RISK OF STIMULANT TREATMENT IN PEDIATRIC ATTENTION-DEFICIT/HYPERACTIVITY DISORDER: UPDATE AND CLINICAL RECOMMENDATIONS.

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.


A CROSS-SECTIONAL STUDY ON SUBSTANCE USE AND FAMILY CHARACTERISTICS OF ADOLESCENTS WITH SYMPTOMS OF ATTENTION DEFICIT AND HYPERACTIVITY.
Onal A, Ogel K, Eke C

Introduction: The genetic aspect of Attention Deficit and Hyperactivity Disorder (ADHD) is recognized without any dispute. For adolescents with a diagnosis of ADHD, development of substance dependency and interfamilial characteristics are important. These are factors which also affect the course of ADHD. Aims: It was intended to investigate the interfamilial characteristics and potential risks of adolescents with and without ADHD, as well as the factors which affect the onset of substance use for adolescents with ADHD.

Method: The research has been conducted in 15 different administrative districts of Istanbul, among 10th grade students from different regions and different levels of socioeconomic status. The multistep cluster sampling method was used for the selection of the sample. YSR 11-18 (Youth Self Report) and a questionnaire which was developed by the researchers were used. A total of 3483 questionnaires were completed.

Results: Among the research sample, 73.5% (n=2009) consisted of young people without any diagnosis. The proportion of participants with ADHD symptoms and no substance use was found to be 12.51% (n=342), participants having both ADHD symptoms and substance use formed 4.02% (n=110) of the sample and the ones without any ADHD symptoms, but present substance use made up 9.95% (n=272) of the sample. Alcohol use of the mother or history of substance use by the mother, father, siblings or relatives is higher for substance users whether or not ADHD symptoms are present, in comparison to other diagnostic groups. When the variables within sociodemographic factors, parent characteristics and the child raising practices of the parents were investigated with a logistic regression analysis, it was found that low academic achievement at school, the mother's alcohol use, the fact that the time when the child is supposed to come home is not certain and the parents' lack of agreed upon behavior regarding rules are the factors which determine substance use among young people with ADHD.

Conclusions: The results of this study have established that low academic achievement at school, the mother's alcohol use, not having a certain time when the child is supposed to come home and the parents' lack of agreed upon behavior regarding rules are the factors which determine substance use among young people with ADHD.
METHYLPHENIDATE INDUCED OBSESSIVE-COMPULSIVE SYMPTOMS TREATED WITH SERTRALINE. 
Coskun M.

Monatsschr Kinderheilkd. 2011;1-6. 
ATTENTION DEFICIT HYPERACTIVITY DISORDER IN SCHOOL-AGED CHILDREN - TEST PERFORMANCE IN COGNITIVE AND NEUROPSYCHOLOGICAL MEASURES. 
Toussaint A, Petermann F. 
The study presented examines cognitive and neuropsychological processes underlying behavioural symptoms of attention deficit hyperactivity disorder (ADHD). Information about the diagnostic process of ADHD is provided by corresponding study results. In English-speaking countries measures based on PASS processes are applied to assess the cognitive and executive deficits specific to ADHD. By considering several dynamic cognitive processes the PASS theory has been shown to be sensitive to the specific cognitive problems and executive deficits of children with ADHD. The role of a current measure based on the PASS theory, the Kaufman-Computerized Assessment Battery for Children (K-CAB), is discussed regarding the diagnostic process. This neuropsychological test battery is able to detect global deficits such as reduced reaction time or unexpected variability in reaction time. Inferences about specific cognitive abilities or behaviour patterns based solely on test results cannot be made.

SYMPTOMS OF ADHD AND DEPRESSION IN A LARGE ADOLESCENT POPULATION: CO-OCCURRING SYMPTOMS AND ASSOCIATIONS TO EXPERIENCES OF SEXUAL ABUSE. 
Background: Symptoms of either attention-deficit hyperactivity disorder (ADHD) or depression constitute the most common reasons for contact with child and adolescent psychiatry. The development of psychiatric symptoms can be explained by a combination of environmental stress events and genetic vulnerability. One common form of environmental stress with high impact on health is sexual abuse. Aims: To investigate the prevalence and co-occurrence of symptoms of ADHD and depression in relation to experiences of sexual abuse in a large adolescent general population. 
Method: All 15- and 18-year-old students (n = 4910) in the Swedish county of Vestmanland answered a school-based screening instrument including the six-question ADHD self-rating scale (ASRS), the Depression Self-Rating Scale (DSRS) and questions relating to experiences of sexual abuse. 
Results: The prevalence of co-occurring symptoms of ADHD and depression was 2.4% (boys 1.0%, girls 3.9%). The prevalence of experience of any sexual abuse was 20.9% (boys 13.3%, girls 28.7%). Of those with co-occurring symptoms, 48% of the boys and 47% of the girls reported a history of sexual abuse. 
Conclusions: School-based screening for co-occurring symptoms of ADHD and depression might be a method that identifies students at psychiatric and psychosocial risk.

WRITTEN-LANGUAGE DISORDER AMONG CHILDREN WITH AND WITHOUT ADHD IN A POPULATION-BASED BIRTH COHORT. 
Yoshimasu K, Barbaresi WJ, Colligan RC, et al. 
OBJECTIVE: We determined the incidence of written-language disorder (WLD) among children with and without attention-deficit/hyperactivity disorder (ADHD) in a population-based birth cohort. 
METHODS: Subjects included a birth cohort of all children born in 1976-1982 who remained in Rochester, Minnesota, after 5 years of age (N = 5718). Information from medical, school, and private tutorial records
was abstracted. Cumulative incidences of WLD with or without reading disability (RD), identified with any of 3 formulas, among children with and without ADHD and hazard ratios (HRs) were calculated.

**RESULTS:** For both genders, the cumulative incidence of WLD by 19 years of age was significantly higher for children with ADHD than for children without ADHD (boys: 64.5% vs 16.5%; girls: 57.0% vs 9.4%). The magnitude of association between ADHD and WLD with RD was significantly higher for girls than for boys (adjusted HR: girls: 9.8; boys: 4.2; \( P < .001 \)). However, this was not true for WLD without RD (adjusted HR: girls: 7.4; boys: 6.6; \( P = .64 \)).

**CONCLUSIONS:** ADHD is strongly associated with an increased risk of WLD (with or without RD) for both boys and girls. Girls with ADHD are at higher risk of having WLD with RD compared with boys with ADHD, whereas boys and girls are at the same risk of having WLD without RD.

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**POSTGRAD MED.** 2011;123:80-88.

**SINGLE-DOSE PHARMACOKINETICS OF NWP06, AN EXTENDED-RELEASE METHYLPHENIDATE SUSPENSION, IN CHILDREN AND ADOLESCENTS WITH ADHD.**

**Childress AC, Randy Sallee F, Berry SA.**

**Background:** Extended-release formulations of stimulants provide once-daily treatment options for patients with attention-deficit/hyperactivity disorder (ADHD). Such preparations are more convenient and may improve compliance, and thus, improve outcomes. Currently, there is no extended-release liquid oral preparation of any stimulant. As such, there is a medical need for a liquid extended-release preparation of methylphenidate for the management of ADHD in children who are unable or unwilling to swallow solid formulations.

**Objective:** To evaluate the single-dose pharmacokinetics of an extended-release oral liquid formulation of methylphenidate (NWP06) in pediatric subjects with ADHD.

**Methods:** Subjects with ADHD received a single oral dose of NWP06 20 or 60 mg. Serial blood samples were obtained before and after drug administration for determination of plasma methylphenidate concentrations and standard pharmacokinetic parameters. Dose- and weight-corrected pharmacokinetic parameters were presented by age group (9-12 years and 13-15 years).

**Results:** A total of 14 youths (7 children aged 9-12 years and 7 adolescents aged 13-15 years) were enrolled and completed the study. Body mass index ranged from 12.08 to 34.08 kg/m2. Mean values of dose and body weight-adjusted maximum plasma concentration (Cmax) (23.8, 22.3, 22.1, 25.7 [ng/mL]/mg) and area under the concentration-time curve (AUC) (208, 199, 239, 210 [hr*(mg/mL)]/[mg/kg]) were similar among all age/dose groups, suggesting dose proportionality and a similar rate and extent of absorption in children and adolescents. Values for Cmax were observed between 2 and 4 hours after the dose. The elimination half-life and body weight-adjusted clearance also appeared to be independent of dose and age. NWP06 was well tolerated with no serious adverse events and no adverse event-related treatment discontinuations.

**Conclusion:** There were no age-related pharmacokinetic differences after oral administration of NWP06 to children or adolescents in this small sample. Over the dose range of methylphenidate used in this study (0.45-3.3 mg/kg), the pharmacokinetics of NWP06 were linear and dose proportional.

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**PRELIMINARY RELIABILITY AND VALIDITY OF A NEW TIME-SENSITIVE ADHD SYMPTOM SCALE IN ADOLESCENTS WITH ADHD.**

**Adler LA, Shaw DM, Spencer TJ, et al.**

**Objectives:** To validate the Time-Sensitive ADHD Symptom Scale (TASS) in the assessment of symptom change during the day in adolescents with attention-deficit/hyperactivity disorder (ADHD).

**Methods:** A total of 40 participants with ADHD aged 13 to 17 years completed 1 or 2 visits, 1 to 9 weeks apart. The TASS and the ADHD Rating Scale-IV (ADHD-RS-IV) were completed twice at each visit: at the time of the clinic visit (in-clinic assessment) and 2 to 6 hours afterwards (evening assessment).
Results: Internal consistency of the TASS was high, with Cronbach's alpha coefficients of 0.91 (in-clinic) and 0.90 (evening) for visit 1, and 0.86 (in-clinic) and 0.86 (evening) for visit 2. Pearson's correlation coefficients between the TASS and ADHD-RS-IV were significant at both visits (P < 0.0001). Stability analyses of the TASS found no significant effect between ratings performed at different visits (P = 0.936), but there was a significant effect of the assessment time within visits (P < 0.0001). There was not a significant visit by assessment time interaction (P = 0.924).

Conclusions: The TASS showed high internal consistency and high concurrent validity with the ADHD-RS-IV. Results of this preliminary study indicate that the TASS is a valid and reliable self-report scale for adolescents with ADHD.


EXPLORING THE IMPACT OF ONCE-DAILY OROS(REGISTERED TRADEMARK) METHYLPHENIDATE (MPH) ON SYMPTOMS AND QUALITY OF LIFE IN CHILDREN AND ADOLESCENTS WITH ADHD TRANSITIONING FROM IMMEDIATE-RELEASE MPH.


Objectives: To explore the clinical and health-related quality of life (HRQoL) outcomes in children/adolescents with attention-deficit/hyperactivity disorder (ADHD) who required a therapy switch from immediate-release (IR) methylphenidate (MPH) and were initiated on Osmotic Release Oral System (OROS(registered trademark)) MPH.

Methods: Prospective, noninterventional study including patients (aged 6-18 years) with a confirmed diagnosis of ADHD who transitioned from IR MPH to OROS(registered trademark) MPH based on medical needs. Patients were transitioned to OROS(registered trademark) MPH and were followed for 12 weeks. Attention-deficit/hyperactivity disorder symptoms, functional outcomes, HRQoL, and tolerability were assessed throughout the study.

Results: 598 patients entered the intention-to-treat analysis. The mean OROS(registered trademark) MPH starting dose was 29.5 (plus or minus) 12.0 mg/day, increasing slightly to 33.5 (plus or minus) 13.2 mg/day at final visit. Compared with baseline, there were significant (all P < 0.0001) symptomatic, functional, and HRQoL improvements after transitioning from IR MPH to OROS(registered trademark) MPH as assessed by the Conners' Parent Rating Scale (from 29.0 (plus or minus) 10.5 to 19.5 (plus or minus) 11.1), Children's Global Assessment Scale (by 11.0 (plus or minus) 13.3), and Inventory for Assessing Quality of Life (ILC) LQ0-28 scores (parents' rating from 17.2 (plus or minus) 3.9 to 19.4 (plus or minus) 4.0; patients' rating from 18.7 (plus or minus) 4.0 to 20.5 (plus or minus) 3.9). Overall, no significant changes in quality of sleep or appetite were observed. More than 70% of parents and physicians rated the effectiveness of OROS(registered trademark) MPH as at least "good" and were at least "satisfied" with OROS(registered trademark) MPH. The most common treatment-emergent adverse events were insomnia and anorexia. No clinically relevant changes in body weight or vital signs were observed.

Conclusions: In this naturalistic setting, transitioning from IR MPH to OROS(registered trademark) MPH, in patients who showed previously insufficient response and/or poor tolerability, was successful. Patients' and parents' HRQoL as well as burden of disease showed a clinically relevant improvement. OROS(registered trademark) MPH was generally safe and well tolerated.


TOWARD DEFINING DEFICIENT EMOTIONAL SELF-REGULATION IN CHILDREN WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER USING THE CHILD BEHAVIOR CHECKLIST: A CONTROLLED STUDY.

Spencer TJ, Faraone SV, Surman CBH, et al.

Objective: Deficient emotional self-regulation (DESR) is characterized by deficits in self-regulating the physiological arousal caused by strong emotions. We examined whether a unique profile of the Child Behavior Checklist (CBCL) would help identify DESR in children with attention-deficit/hyperactivity disorder (ADHD).
**Methods:** Subjects included 197 children with ADHD and 224 children without ADHD. We defined DESR if a child had an aggregate cut-off score of > 180 but < 210 on the Anxiety/Depression, Aggression, and Attention scales of the CBCL (CBCL-DESR). This profile was selected because of: 1) its conceptual congruence with the clinical concept of DESR; and 2) because its extreme (> 210) form has been previously associated with severe forms of mood and behavioral dysregulation in children with ADHD. All subjects were comprehensively assessed with structured diagnostic interviews and a wide range of functional measures.

**Results:** Forty-four percent of children with ADHD had a positive CBCL-DESR profile versus 2% of controls (P < 0.001). The CBCL-DESR profile was associated with elevated rates of anxiety and disruptive behavior disorders, as well as significantly more impairments in emotional and interpersonal functioning.

**Conclusions:** The CBCL-DESR profile helped identify a subgroup of children with ADHD who had a psychopathological and functional profile consistent with the clinical concept of DESR.

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**Psychiatry Res. 2011;189:281-87.**

**MICRONUTRIENTS REDUCE STRESS AND ANXIETY IN ADULTS WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER FOLLOWING A 7.1 EARTHQUAKE.**

**Rucklidge J, Johnstone J, Harrison R, et al.**

The role of good nutrition for resilience in the face of stress is a topic of interest, but difficult to study. A 7.1 earthquake took place in the midst of research on a micronutrient treatment for Attention-Deficit/Hyperactivity Disorder (ADHD), providing a unique opportunity to examine whether individuals with ADHD taking micronutrients demonstrated more emotional resilience post-earthquake than individuals with ADHD not taking micronutrients. Thirty-three adults with ADHD were assessed twice following the earthquake using a measure of depression, anxiety and stress also completed at some point pre-earthquake (baseline). Seventeen were not taking micronutrients at the time of the earthquake (control group), 16 were (micronutrient group). While there were no between-group differences one week post-quake (Time 1), at two weeks post-quake (Time 2), the micronutrient group reported significantly less anxiety and stress than the controls (effect size 0.69). These between group differences could not be explained by other variables, such as pre-earthquake measures of emotions, demographics, psychiatric status, and personal loss or damage following the earthquake. The results suggest that micronutrients may increase resilience to ongoing stress and anxiety associated with a highly stressful event in individuals with ADHD and are consistent with controlled studies showing benefit of micronutrients for mental health.

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**Psychiatry Res Neuroimaging. 2011.**

**STRIATAL VOLUMES IN PEDIATRIC BIPOLAR PATIENTS WITH AND WITHOUT COMORBID ADHD.**

**Liu IY, Howe M, Garrett A, et al.**

The most prevalent comorbid disorder in pediatric bipolar disorder (BD) is attention-deficit/hyperactivity disorder (ADHD). As caudate volume abnormalities have been demonstrated in both BD and ADHD, this study sought to determine whether these findings could be attributed to separable effects from either diagnosis. High resolution anatomical magnetic resonance (MRI) images were obtained from youth in 4 groups: BD with comorbid ADHD (n = 17), BD without comorbid ADHD (n = 12), youth with ADHD alone (n = 11), and healthy control subjects (n = 24). Caudate, putamen, and globus pallidus volumes were manually traced for each subject using BrainImageJava software by a reliable rater blinded to diagnosis. There was a significant effect of diagnosis on striatal volumes, with ADHD associated with decreased caudate and putamen volumes, and BD associated with increased caudate, putamen, and globus pallidus volumes. Thus, the presence or absence of comorbid ADHD in patients with BD was associated with distinct alterations in caudate volumes, suggesting that these groups have different, but related, mechanisms of neuropathology.
Evaluation of visuoconstructional abilities is a common part of clinical neuropsychological assessment, and the Beery-Buktenica Developmental Test of Visual-Motor Integration (VMI; K. E. Beery & N. A. Beery, 2004) is often used for this purpose. However, few studies have examined its psychometric properties when used to assess children and adolescents with traumatic brain injury (TBI) or attention-deficit/hyperactivity disorder (ADHD), even though these are among the most common acquired and neurodevelopmental forms of brain dysfunction in children. This study examined the validity of VMI scores in 123 children with TBI and 65 with ADHD. The TBI and ADHD groups performed significantly worse than the standardization sample, obtaining VMI mean scores of 87.2 (SD = 13.7) and 93.5 (SD = 11.27). Previous research has noted decrements in visuoconstructional abilities in TBI but relative sparing in ADHD. To examine the criterion validity of VMI scores, the authors therefore compared these 2 groups. As anticipated, the TBI group performed significantly worse than the ADHD group, but receiver operator characteristic analysis indicated that VMI scores were poor at discriminating between groups. Nonetheless, convergent validity evidence supported interpretation of VMI scores as measuring perceptual organization in both groups. In particular, principal components analysis indicated that VMI total scores loaded with perceptual organization tests from the Wechsler Intelligence Scale for Children, 3rd ed. (WISC-III; D. Wechsler, 1997), and its highest correlation was with the WISC-III Perceptual Organization Index. Also, the VMI correlated significantly with the Grooved Pegboard test for the group with TBI. These findings suggest that VMI scores are sensitive to visuoconstructional and motor deficits in children with developmental and acquired brain dysfunction.

Research that has assessed the psychophysiological consequences of caregiver stress in young and middle aged caregivers, that is, in populations not contending with age associated decline of the endocrine and immune systems, has been scarce and yielded inconsistent findings. To extend work in this area, this study assessed the psychosocial, endocrine and immune consequences of caregiver stress in a cross sectional sample of young and middle aged caregivers of children with autism and attention deficit hyperactivity disorder (ADHD) compared against parents of typically developing children. Caregivers (n = 56) and parent controls (n = 22) completed measures of psychological distress (perceived stress, anxiety/depression), social support and physical health complaints. To capture important indices of the diurnal cortisol pattern, cortisol was measured at waking, 30 min post waking, 1200 h and 2200 h on two consecutive weekdays. Venous blood was taken to assess systemic concentrations of proinflammatory biomarkers, interleukin-6 (IL-6) and C-reactive protein (CRP). Caregivers scored markedly higher on all measures of psychological distress; scores on social support subscales, however, were significantly lower in this group. Diurnal patterns of cortisol secretion did not differentiate between the groups; however, caregivers displayed elevated systemic concentrations of the proinflammatory biomarker, CRP and reported more frequent episodes of physical ill health. The stress of caregiving exacts a significant psychophysiological toll, that is, even in the absence of HPA dysregulation, caregivers demonstrated elevated concentrations of proinflammatory biomarkers and, therefore, might be at greater risk for diseases fostered by disinhibition of the inflammatory response.
Nutrition and attention deficit hyperactivity disorder: developmental follow-up of the anthropometric variables of a group of patients receiving treatment with osmotic controlled-release methylphenidate.

Dura-Trave T, Eugenia Yoldi-Petri M, Zardoya-Santos P.

Aim. To perform a developmental analysis of the anthropometric variables of a group of patients diagnosed with attention deficit hyperactivity disorder (ADHD) in order to determine the repercussions of treatment with osmotic controlled-release methylphenidate (MTF-OROS).

Patients and methods. The medical records of 187 patients with ADHD under treatment with MTF-OROS over a period of 30 months were reviewed. Data collected included weight, height and body mass index at diagnosis (baseline) and at 6, 12, 18, 24 and 30 months' follow-up.

Results. The mean age at diagnosis was 8.14 (plus or minus) 1.6 years. The dose of MTF-OROS was progressively increased until 36.9 (plus or minus) 12.1 mg/day (1.05 mg/kg/day) at day 30 of the follow-up. At diagnosis, 34.9% of patients had a deficient nutritional situation (subnutrition or malnutrition), which affected 50.3% of the patients at 30 months. The baseline value for weight (Z-score) progressively decreased during treatment until values that were significantly lower than the baseline value at 12 months were reached (p < 0.05); these values remained significantly lower until 30 months. The baseline value for height (Z-score) also progressively decreased during treatment until values that were significantly lower than the baseline value at 24 and 30 months were reached (p < 0.05).

Conclusions. At the time they were diagnosed with ADHD, one out of every three patients was in a deficient nutritional situation (subnutrition or malnutrition). Continued treatment with MTF-OROS for 30 months had a negative influence on height, which could perhaps be attenuated by improving the patients' nutrition.

Rare copy number variation discovery and cross-disorder comparisons identify risk genes for ADHD.

Lionel AC, Crosbie J, Barbosa N, et al.

Attention deficit hyperactivity disorder (ADHD) is a common and persistent condition characterized by developmentally atypical and impairing inattention, hyperactivity, and impulsiveness. We identified de novo and rare copy number variations (CNVs) in 248 unrelated ADHD patients using million-feature genotyping arrays. We found de novo CNVs in 3 of 173 (1.7%) ADHD patients for whom we had DNA from both parents. These CNVs affected brain-expressed genes: DCLK2, SORCS1, SORCS3, and MACROD2. We also detected rare inherited CNVs in 19 of 248 (7.7%) ADHD probands, which were absent in 2357 controls and which either overlapped previously implicated ADHD loci (for example, DRD5 and 15q13 microduplication) or identified new candidate susceptibility genes (ASTN2, CPLX2, ZBBX, and PTPRN2). Among these de novo and rare inherited CNVs, there were also examples of genes (ASTN2, GABRG1, and CNTN5) previously implicated by rare CNVs in other neurodevelopmental conditions including autism spectrum disorder (ASD). To further explore the overlap of risks in ADHD and ASD, we used the same microarrays to test for rare CNVs in an independent, newly collected cohort of 349 unrelated individuals with a primary diagnosis of ASD. Deletions of the neuronal ASTN2 and the ASTN2-intronic TRIM32 genes yielded the strongest association with ADHD and ASD, but numerous other shared candidate genes (such as CHCHD3, MACROD2, and the 16p11.2 region) were also revealed. Our results provide support for a role for rare CNVs in ADHD risk and reinforce evidence for the existence of common underlying susceptibility genes for ADHD, ASD, and other neuropsychiatric disorders.
Sleep Med. 2011.

**Sleep in Children with Williams Syndrome.**


**Objective:** To analyze sleep in children with Williams Syndrome (WS) compared to normal healthy controls in order to determine whether particular sleep features are characteristic of WS, and to explore associations between disturbed sleep and behavior.

**Methods:** Thirty-five children with genetically-confirmed WS and 35 matched controls underwent overnight polysomnography and performance testing in the Sleep Center at the Children's Hospital of Philadelphia. Parents completed questionnaires regarding the subjects' sleep and behavior.

**Results:** WS subjects had significantly different sleep than controls, with decreased sleep efficiency, increased respiratory-related arousals and increased slow wave sleep on overnight polysomnography. WS subjects were also noted to have more difficulty falling asleep, with greater restlessness and more arousals from sleep than controls. Fifty-two percent of WS subjects had features of attention deficit-hyperactivity disorder.

**Conclusion:** Children with WS had significantly different sleep than controls in our sample. These differences demonstrated in our study may reflect genetic influences on sleep.

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**Prevalence of Attention-Deficit/Hyperactivity Disorder (ADHD) Symptomatology and Psychiatric Co-Morbidity Among Adolescents Diagnosed with ADHD in Childhood.**


**Objectives.** Given the paucity of research on adolescent attention-deficit/hyperactivity disorder (ADHD), this study aimed to establish the prevalence of Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) ADHD in a cohort of South African adolescents who had been diagnosed with the disorder in childhood. It also aimed to establish the prevalence of psychiatric co-morbidities and adjustment difficulties in this sample.

**Method.** Data regarding age of diagnosis, current ADHD status, current ADHD-related pharmacological management, current psychopathology and current adjustment were gathered from 64 adolescents and their guardians via self-report questionnaire. Descriptive statistics were calculated with regard to current ADHD status, co-morbid psychopathology and adjustment difficulties, as well as current ADHD-related medication.

**Results.** According to parent reports, 59.38% of the sample met DSM-IV criteria for ADHD Inattentive subtype, while 37.50% met the criteria for ADHD Hyperactive/Impulsive subtype. Of the adolescents, 64.06% were still using stimulant medication. Based on the adolescent self-report, 43.75% of the sample had clinically significant symptoms of psychopathology or mal adjustment. Furthermore, 39.28% met the diagnostic criteria for at least one psychiatric co-morbidity.

**Conclusion.** ADHD persisted into adolescence in the current sample. A significant psychopathological and maladjustment load appears evident among adolescents previously diagnosed with ADHD, despite continuous pharmacological management of the condition.
before calculating frequencies to characterize trends in patient and practice factors, as well as ADHD medication utilization.

**RESULTS:** Visits for ADHD in children increased from 7.9 to 15.3 million (93%) from 1998-2007. Across all years, ~75% of visits were made by males. Visits were frequently made by white children (>80% in all years) with a trend of increasing visits by non-white children by 2006-2007 (13.0% in 1998-1999 to 20.1% by 2006-2007). Visits among pediatricians rose from 30.3% in 1998-1999 to 48.4% in 2006-2007 with a decrease in specialist visits (from 43.1% to 33.7% of all visits). Across all years, mono-therapy was the predominant medication prescription (>60%), although ~1/3rd of all visits did not note an ADHD medication. The use of methylphenidate mono-therapy dropped from 40.8% in 1998-1999 to 27.9% in 2006-2007. Dextroamphetamine mono-therapy rose from 19.3% to 28.7% from 1998-1999 to 2002-2003, but then fell to 22.3% by 2006-2007. The use of newer non-stimulant medications was apparent starting in 2002, but remained low (~10%) across the rest of the interval.

**CONCLUSIONS:** Visits made by children with ADHD increased over the decade, while use of medications for ADHD, particularly stimulants, decreased by 2006-2007 with no corresponding increase in the use of newer non-stimulant agents. New therapeutic options, changing guidelines, and emerging safety concerns make this an important area for ongoing research.

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TRENDS AND PATTERNS IN THE DIAGNOSIS AND PRESCRIBING OF PSYCHOTROPIC MEDICATIONS IN CHILDREN AND ADOLESCENTS WITH ADHD.

**Kelwalkar A, Nayak R.**

**OBJECTIVES:** Our study seeks to assess national variations in physician diagnosis of Attention Deficit Hyperactivity Disorder (ADHD) and test a hypothesis that family practitioners are more likely to diagnose and prescribe medications for ADHD than specialists. Further, the study seeks to examine trends and patterns in the use of stimulant medications in children and adolescents with ADHD.

**METHODS:** We used data from National Ambulatory Medicare Care Survey (NAMCS), an on-going annual survey of a representative sample of US office-based physician practices. The frequency and rate of ADHD-related visits were analyzed using a weighted sample of youths aged 18 years and younger and trends were tracked for diagnostic prevalence and psychotropic medication use for the years 2003-2006. Utilization of psychotropic medications was focused on stimulant drug use and second line ADHD medications.

**RESULTS:** A total of 5,319,764 visits having ADHD as primary diagnosis were identified in 2006, representing an increase of about 11% from 2003. The primary diagnosis of ADHD was identified in 2006, representing an increase of about 11% from 2003. The primary diagnosis of ADHD was made increasingly by non specialist physicians (pediatricians, family practitioners, internists and others; from 43.3% in 2003 to 46.9% in 2006) compared to specialists (child and general psychiatrists and neurologists) during the period covered. As pediatrician diagnosis of ADHD rose from to 32.5% in 2003 to 50% in 2006, diagnosis by child psychiatrists declined significantly from 37.3% to 18.9% (P < 0.05) during the same period. The prescribing of long-acting stimulants increased from 42.8% in 2003 to 47.1% in 2006, and an opposite trend was observed for the short-acting agents during the same period (decreased by 8.5%).

**CONCLUSIONS:** Nonspecialist physicians are more likely to diagnose ADHD and prescribe psychotropic medications than specialists, further underscoring the controversy surrounding ADHD treatment. Dramatic changes in the patterns of psychotropic medication use in outpatient medical practice may be a cause for concern.

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**ADHERENCE TO MEDICATION FOR ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD): DOES THE TIMEFRAME MATTER?**

**Barner JC, Khoza S, Oladapo A.**

**OBJECTIVES:** ADHD medication users frequently take 'drug holidays' during the summer months. The study objective was to compare ADHD medication adherence for an entire year (EY-365 days) and the school year (SY-270 days) by medication class and type.

**METHODS:** Continuously enrolled Texas Medicaid children (less-than or equal to) 18 years) who had (greater-than or equal to) 2 prescription claims for an ADHD medication served as the study population. EY and SY (September 1-May 31), prescription claims were extracted from July 2002-December 2008. Prescription claims were grouped by medication class [immediate release(IR), extended release(ER), long-acting(LA), non-stimulant(NS)]; and medication type [stimulant(S) vs. non-stimulant(NS)]. Adherence, assessed by medication possession ratio (MPR) using a fixed interval denominator, was measured both continuously and dichotomously (80%). T-tests, ANOVAs and chi-square were employed to determine differences between groups.

**RESULTS:** Overall mean adherence for EY (n = 62,789) was 49.8 (plus or minus) 30.3 and SY (n = 50,842) was 62.2 (plus or minus) 26.2. For EY, mean medication class adherence was not significantly different between NS (52.5 (plus or minus) 30.9) and ER (52.1 (plus or minus) 30.2); however, LA (47.6 (plus or minus) 30.9) and IR (37.2 (plus or minus) 27.1) were significantly lower (p < 0.0001). Regarding SY, adherence was not significantly different among ER (63.7 (plus or minus) 26.0), LA (63.5 (plus or minus) 23.8) and NS (62.9 (plus or minus) 27.0), while IR (52.8 (plus or minus) 24.7) was significantly lower (p < 0.0001). When adherence was dichotomized, EY medication class adherence differed significantly (p < 0.0001): NS(25.8%), ER(24.1%), LA(21.2%), IM(9.8%). Similarly, SY differed significantly (p < 0.0001): NS(30.8%), ER(24.1%), LA(25.6%), IM(16.2%). NS had significantly higher mean adherence than S, respectively: EY(52.5 (plus or minus) 30.9 vs. 49.4 (plus or minus) 30.2; p < .0001) and SY(62.9 (plus or minus) 27.0 vs. 62.1 (plus or minus) 26.1; p < .01). When dichotomized, results were similar (p < .0001): EY(25.8% vs. 21.5%) and SY(30.8% vs. 27.9%).

**CONCLUSIONS:** Subjects were more adherent during SY compared to EY. Medication class mean adherence differed depending on timeframe used. For analyses comparing NS and S, NS had significantly higher adherence, however for SY mean adherence, the difference may not be practically significant. Due to unique patient medication-taking behaviors, ADHD medication adherence differs depending on the timeframe used.

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**DIFFERENTIAL PATTERNS OF DISORDERED EATING IN SUBJECTS WITH ADHD AND OVERWEIGHT.**

**Wilhelm C, Marx I, Konrad K, et al.**

**Objectives:** Despite growing evidence for an association between overweight and attention-deficit/hyperactivity disorder (ADHD), still little is known about the mechanisms underlying this relationship.

**Methods:** Within a two (no ADHD, ADHD) null two (normal weight, overweight) factorial design (n = 94) we tested disordered eating behaviour in a laboratory breakfast procedure as well as delay aversion (DA) in male children aged 7-15 years.

**Results:** While children with ADHD tended to eat above the normal level particularly at the beginning of the meal, children with overweight tended to eat above the normal level throughout the whole meal. Furthermore, preference for immediately available food was predicted by parental ratings of inattention and neuropsychological measures of DA in overweight children, and by impulsivity in children with ADHD.

**Conclusions:** Our results suggest distinct neuropsychopathological pathways to abnormal eating in ADHD and overweight. Thus, children with overweight might benefit more from specialized treatment programmes that aim at improving attention functions while in children with ADHD the treatment should focus on impulsivity.

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**MODIFIED MAGNESIUM AND LIPOPROTEINS IN CHILDREN WITH ATTENTION DEFICITE HYPERACTIVITY DISORDER (ADHD).**

Irmisch G, Thome J, Reis O, et al.

**Objective.** Polyunsaturated fatty acids (PUFAs) have shown to be helpful in the therapy of ADHD. Various stabilizing co-factors may contribute to this effect, as like magnesium (Mg). Mg supports fatty acid enzyme activity and is essential for the neuronal activity. However, the way of Mg to influence psychic processes, particularly in ADHS, is not yet known precisely. Therefore, in this study the concentrations of further lipid parameters were assessed. We intended to prove, if there is a lack of Mg and someone different lipoprotein concentration in ADHD patients compared to controls.

**Methods.** In nine boys with ADHD (8.2 (plus or minus) 0.6 years) and 11 controls (7.9 (plus or minus) 0.87 years), blood serum Mg, total cholesterol, triglycerides, Lipoprotein Lipase, total Phospholipids, Apolipoproteins a and b, HDL-and LDL-cholesterol were measured, under two different stressful conditions.

**Results.** In ADHD, Mg and HDL concentrations were significantly higher and Apob lower than in controls.

**Conclusions.** Contrary to our supposition, in ADHD was no lack, but an excess of Mg. HDL was heightened and Apob lowered. Lipoprotein metabolism seems to be modified in ADHD.

**INTELLIGENCE MODERATES IMPULSIVITY AND ATTENTION IN ADHD CHILDREN: AN ERP STUDY USING A GO/NOGO PARADIGM.**


**Objectives.** If the cardinal symptoms of ADHD hyperactivity, impulsivity and inattention are combined with a learning disability (70 (greater-than or equal to) IQ < 85), the question arises whether a child shows hyperkinetic behaviour because of intellectual overload in a challenging situation, for example at school. Perhaps, this behaviour is not a primary attention deficit disorder but an impulse control disorder, determined by the primarily intelligence level. It raised the question whether attention deficit and impulse control regarded as behavioural inhibition deficit may depend on intelligence and therefore should be separated into distinct clinical entities.

**Methods.** A total of 45 children (15 with ADHD, 15 with learning disabilities (LD), 15 with ADHD and learning disabilities) were compared in a matched-pair design with 42 control children using a go/no go paradigm (visual continuous performance test, CPT). The dependent variable was the target P3 amplitude, averaged from a 1020 EEG measurements under distinct trigger conditions. For statistical analysis, a three-factor analysis of variance (MANOVA) with repeated measurements was used. In a subsequent regression analysis with residuals, the influence of intelligence (IQ) was calculated and a "parallel analysis of variance" was conducted.

**Results.** No differences in the P3 amplitudes in the comparison ADHD-control group were found. Reduced P3 amplitudes as main effects in the LD group compared with controls were found and a significant group-dependent interaction on reduced P3 amplitudes comparing ADHD + LD versus control group. Using residuals (IQ), this interaction was not longer verifiable.

**Conclusion.** Impulsivity and attention deficit as the cardinal symptoms of ADHD, regarded as behavioural inhibition deficit, are essentially moderated by the primary intelligence, rather than by an attention deficit. The lower the IQ, the more ADHD surfaces as a disturbed impulsivity and lesser as an attention deficit.

**ALTERED mRNA EXPRESSION OF MONOAMINERGIC CANDIDATE GENES IN THE BLOOD OF CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER AND AUTISM SPECTRUM DISORDER.**


**Objectives.** In absence of objective clinical characteristics the identification of peripheral biomarkers in neuropsychiatric disorders is highly relevant for the diagnostic process and an individualized therapy. We analyzed mRNA-expression of monoaminergic candidate genes (DRD4, DRD5, TPH1) in peripheral tissue.
of patients with attention deficit hyperactivity disorder (ADHD) and autism spectrum disorders (ASD), highly comorbid with ADHD, searching for possible molecular markers for these disorders.

**Methods.** mRNA was obtained from children and adolescents with ADHD (n = 51) and ASD (n = 26), diagnosed according to ICD-10 criteria, as well as healthy controls (n = 39). mRNA expression was determined via quantitative realtime PCR (qRT-PCR) from whole blood cells.

**Results.** The concentrations of DRD4-mRNA in the whole blood were significantly lower in ADHD and ASD children (19 of 26 comorbid with ADHD) compared to healthy controls. ASD patients revealed a significantly decreased DRD5 mRNA expression in comparison to the two other groups.

**Conclusions.** Alterations in mRNA expression patterns provide further evidence for a relevant effect of the respective candidate genes in the pathophysiology of ADHD. Given their potential as biomarkers mRNA expression patterns may be useful tools in (differential-) diagnostic procedures of ADHD and ASD. Future studies may determine the sensitivity and specificity of these putative biomarkers in larger samples including further neuropsychiatric diagnoses.


**PSYCHOPHYSIOLOGICAL DISTURBANCES IN ATTENTION-DEFICIT HYPERACTIVITY DISORDER IN ADOLESCENTS. Glushchenko VV.**

We have studied 128 adolescents, aged 15-16 years, with attention-deficit hyperactivity disorder (ADHD) using clinicopsychopathological, psychometric and electroencephalographic methods. Taking into account the age dynamics, the following components of ADHD have been singled out: motor (impulsivity-hyperactivity), subjective-cognitive (attention deficit) and somato-autonomic. The significance of subjective-cognitive disturbances, along with neuropsychiological dysfunction, in the ADHD pathogenesis has been proved. Quantitative (productivity deficit) and qualitative (concentration deficit) disorders have been assessed. Author substantiated the deficit of emotional-motivational self-regulation measured by the M. Luscher test and the Self-assessment scale. The specific for ADHD pattern of alpha-rhythm reactivity has been found in EEG.
### Calendario degli incontri

Tutti gli incontri avranno inizio alle ore 9.00

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**2011 - 2012**

**PROGETTO REGIONALE**

**CONDIVISIONE DI PERCORSI DIAGNOSTICO-TERAPEUTICI**

**PER L’ADHD**

**IN LOMBARDIA**

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Seminari di informazione e approfondimento per pediatrici sui disturbi dell’attenzione e dell’iperattività
Programma dell’incontro

1 giornata suddivisa nei seguenti moduli:

MODULO N° 1: Cos’è l’ADHD

- Quadrato clinico e classificazione diagnostica
- Diagnosi differenziale e comorbilità
- Epidemiologia: presentazione di dati internazionali e nazionali
- Presentazione di casi

MODULO N° 2: Il ruolo del Pediatra

- Modalità di screening da parte del pediatra
- Modalità di invio e accesso ai centri per la diagnosi specialistica: alleanza terapeutica tra pediatra e NPI
- Trattamenti farmacologici
- Trattamenti multimodali

Per informazioni e chiarimenti:
Dr. Gianluca Daffi
NPI Ospedale dei Bambini,
Speciali Civili di Brescia
Corso capofila di progetto
daaffi.gianluca@gmail.com

Aspetti organizzativi

La serie di seminari proposti si inserisce all’interno delle attività di formazione e informazione previste dal progetto regionale “Condivisione di percorsi diagnostico-terapeutici per l’ADHD in Lombardia”.

L’incontro in questione, ripetuto secondo standard condivisi presso ognuno dei 18 centri, aderenti e a cura dei referenti di ogni centro, è rivolto ai pediatri del territorio i quali, partecipando a una delle edizioni proposte, avranno modo di implementare le seguenti competenze:

- Conoscere e riconoscere il quadrato clinico caratteristico dell’ADHD
- Conoscere le principali diagnosi differenziali e gli elementi di comorbilità
- Conoscere la diffusione epidemiologica del disturbo
- Conoscere le corrette modalità di invio e accesso ai centri territoriali
- Conoscere le principali forme di trattamento multimodale

La partecipazione all’incontro è gratuita, ogni incontro avrà durata massima di 4 ore.

Ai partecipanti, ove previsto, verranno riconosciuti i relativi crediti ECM.
Date e sedi delle edizioni

Prima edizione: Ottobre 2011
BRESCIA
AULA B, FACOLTÀ DI MEDICINA E CHIRURGIA
VIALE EUROPA, 11
5 ottobre 2011
28 ottobre 2011
11 novembre 2011

Seconda edizione: Novembre 2011
MILANO
A. OSPEDALIERA FATEBENEFRATELLI
CORSO DI PORTA NUOVA, 23
25 novembre 2011
28 novembre 2011
16 dicembre 2011

Terza edizione: Gennaio 2012
GARBAGNATE MILANESE
AULA MAGNA OSPEDALE GARBAGNATE MILANESE, A. OSPEDALIERA G. SALVING, VIALE FORLANINI 121
17 gennaio 2012
27 gennaio 2012
10 febbraio 2012

L’incontro è rivolto agli operatori della NPI della Regione Lombardia che, nei mesi successivi alla conclusione del percorso, si impegnino ad avviare percorsi di Parent Training presso il proprio centro.

Inviate l’adesione con i nominativi via e-mail all’indirizzo:

manopoli@libero.it (inserire, a caso, una delle sigle: bre, mln, gmb)

specificando:
Nome e cognome dei partecipanti
Centro di riferimento
Funzione all’interno del centro

L’organizzazione si riserva il diritto di selezionare i partecipanti in base alla coerenza tra caratteristiche del percorso e funzione rivolta dall’operatore all’interno del centro nonché in base al numero di posti disponibili.

SEGRETERIA ORGANIZZATIVA:
Sanitario Territoriale Npi Spedali Civili di Brescia
Tel. 0303704433
Fax 0303704436

Coordinamento gestionale:
Dott. Gianluca Daffi
daffi.gianluca@gmail.com

Ottobre 2011 - Gennaio 2012
BRESCIA - MILANO - GARBAGNATE
PROGRAMMA DEL CORSO

Prima giornata
A cura degli operatori dei centri aderenti al progetto ADHD Lombardia

Modulo 1 - dalle 9 alle 13
Cos’è il Parent Training: modelli a confronto

- Introduzione al concetto di parent training in un’ottica di intervento multimodale
- Presentazione di vari modelli di parent training e aggiornamento sulla letteratura esistente
- Analisi di casi e presentazione di esperienze
- Aspetti organizzativi legati all’avvio di un gruppo di parent training
- Le competenze degli operatori coinvolti

Modulo 2 - dalle 14 alle 18
La domanda proveniente dalle famiglie

- Tipologie di utenza e criteri di selezione del gruppo
- Strumenti per la selezione
- Esercitazione relativa all’applicazione degli strumenti e alla formazione del gruppo
- La gestione delle aspettative dei genitori: simulazione e discussione

Seconda giornata

Modulo 3 - dalle 9 alle 13
A cura della D.ssa Sara Pezzica
Patologi, ginecologi, specialista in ADHD e patologie correlate

Contenuti, strategie e strumenti da utilizzare nel percorso di parent training

- La struttura degli incontri di parent training
- Definizione degli aspetti organizzativi e del protocollo condiviso
- Strumenti e strategie per la conduzione dei gruppi

Modulo 4 - dalle 14 alle 18
A cura della D.ssa Tiziana De Meo
Psicologo, Presidente sede Veneto AIADA e consulente clinica Neuropsichiatria pediatrica. ASL 10 San Dona di Piave (VE)

Simulazione di un percorso di parent training

- Strumenti e strategie per la conduzione dei gruppi
- Gli strumenti di verifica dell’efficacia del percorso
- Analisi di casi e presentazione di esperienze

Terza giornata

Modulo 5 - dalle 14 alle 18
A cura di dr Gianluca Dafi, D.ssa Paola Efedri, D.ssa Elena Filippini
NPI Speciali Civili di Brescia, Centro Capofila di progetto

Follow up sul percorso svolto

- Follow up finale
- Messa a sistema delle procedure per l’avvio e la realizzazione del Parent Training
- Simulazione e verifica finale

La partecipazione al percorso è gratuita per gli operatori indicati dalle NPI della Regione Lombardia

Ai partecipanti regolarmente iscritti e frequentanti verranno riconosciuti i relativi crediti ECM
Sede dell'incontro
Aula Magna, Università degli Studi di Milano
Via Festa del Perdono, 7
MILANO

ECM
E’ stato richiesto l’accreditamento ECM Regione Lombardia per neuropediatrici infantili, psicologia, interventi della neuropsicocomunicazione.
Crediti prossimati 5,6

Accreditamento Assistenti Sociali
Il convegno è in attesa dal recupero dei crediti per la formazione continua degli Assistenti Sociali.

L’attestato L.U.M. sarà rilasciato a tutti coloro che saranno presenti fino al termine dei lavori.

Iscrizione
Completere e inviare la scheda di iscrizione alla Segreteria organizzativa entro 11 ottobre 2011, le iscrizioni dovranno essere in arrivo al più tardi entro il 15 ottobre 2011. La partecipazione è gratuita.

Segreteria organizzativa e info
Settore Corvenghi
Tel 03 1/877 359 Fax 03 1/877 376
CONF.P.H.H.P.I.N.F.HT
IRCCS E. Medea
Associazione La Nostra Famiglia
Via don Luigi Monda, 20
20124 Busto Arsizio (LC)

Segreteria scientifica
Mauro Molteni
Conf. Programma Nazionale di Ricerca Strategica in età evolutiva - IRCCS E. Medea, Busto Arsizio (LC).

Comitato promotore
Gian Vittorio Pagano, Giovanni De Girolamo, Filippo Maruteri, Angelo Picardi, Massimo Molteni
Responsabili scientifici progetti di ricerca

PROMUOVERE LA SALUTE MENTALE NELL’ETÀ EVOLUTIVA
I contributi della ricerca italiana

Presentazione dei risultati del Primo Programma Nazionale di Ricerca Strategica in età evolutiva

25.10.2011
Aula Magna
Università degli Studi - MILANO
DALLA PARTE DEI BAMBINI, non uno slogan, ma "modo di essere" di chi è impegnato nella ricerca biomedica e clinica delle patologie neuropsicologiche infantili, per guardare – quasi in parte di profilo – una relazione informale che descrive l’evoluzione del campo del trattamento della Vla: ‘già e men ancora’.

Senza avere parafrase nella complessità della mente umana, che si sviluppa lungo una traiettoria sconosciuta e determinata dalla complessa architettura delle reti neurali, piastrelata dall’insensibile forza modellatrice dell’ambiente, unica nella sua individualità originale fondata sulla condizione relativa non l’atto di una insopprimibile condizione dell’essere umano che ha il suo estremo originale nel primogenito incontro fisico con la madre e con il padre.

DALLA PARTE DEI BAMBINI, per promuovere il loro benessere, individuando quei fattori biologici, ambientali e relazionali che possono ostacolare lo sviluppo delle loro naturali competenze e determinare la comparsa della malattia mentale.

Promuovere la salute mentale attraverso interventi complessi, fondati sulle evidenze, che favoriscano l’acquisizione di abilità utili al far fronte alla complessa intreccio ambientale, riducendo l’impatto negativo delle anomalie biologiche e strutturali, facilitando queste modificazioni del microcosmo ambientale che in numero più “ammessi” o resistenti alla insopesimibile non diversità che accompagna la vivacità della vita.

DALLA PARTE DEI BAMBINI, non per creare un’isola che avvela, fondata su imprimo cinica e divisa in sezioni, ma perché Scienze e Cura siano messe, senza indugi, al servizio dei più piccoli e dei più secolari.

**Sessione matutina**

Salute mentale e preadolescenza


**Programma**

 SESSIONE POMERIDIANA

**Autismo infantile**

Lezione:
Massimo Molinari, Coor. Progetto Nazionale di Ricerca Strategie in età evolutiva - IRCCS C. Monza, Istituto Freni, Milano

14.00 Discutente:
Pierpaolo Marzetti, Università NABA, Milano

14.10 Discusione:
Luca Di Pisa, Università Cattolica, Roma

14.20 Intervento di supporto:
Anna Maria Ruffini, Apsi, Milano

15.00 Intervento di supporto:
Anna Maria Ruffini, Apsi, Milano

15.10 Intervento di supporto:
Anna Maria Ruffini, Apsi, Milano

16.00 Trattamento dell'autismo in età evolutiva: presentazione

- Vincenzo De Vita, Università Cattolica, Roma

16.10 Presentazione:
- Vincenzo De Vita, Università Cattolica, Roma

**Conclusione**

M. Trifunac, Apsi, Milano
Lunedì 7 novembre

IL PRIMO LATO: LA DIAGNOSI COME LINGUAGGIO
Chairman: Paolo Curcio, Professore di Neuropsichiatria infantile, Università degli Studi "Tor Vergata" Roma
Enzo Sechi, Professor Associato di Neuropsichiatria infantile, Università degli Studi "L'Aquila"

I fondamenti teorico-praktici
09:00 Michele Alemaakt, Professor di Logica, Università Roma "Tor Vergata"
Su alcune sue logiche in Psichiatria delle emozioni, considerare, decidere, predire
09:30 Renato Donfrancesco, Professor Associato di Neuropsichiatria infantile, Università degli Studi "Tor Vergata"
La costruzione linguistica del DSM-IV: utilità per la pratica ambulatoriale quotidiana

10:15 Anthony Scambler, Director, London Research Institute, London
Psicologia, biologia e psichiatria: uno sguardo alla ricerca della Salomo Mayer, Berlino
Il dilemma della diagnosi: Quale logica nel DSM-V?

Diagnosi categoriale e dimensionale
10:30 Maria Grazia Malagó, Cassa di Neuropsichiatria infantile, Università "Tor Vergata" Roma
La Diagnosi Categoriale e le interazioni pre-scala il tre
11:15 Antonio Mancini, Rappresentante di Neuroscienze della salute e sindrome, Università di Roma "La Sapienza"
La Diagnosi Dimensionale: il contesto dimensionale delle diagnostiche di bambini e adulti

11.30 Coffee Break

IL SECONDO LATO: LA DIAGNOSI COME RICONOSCIMENTO DELLA INDIVIDUALITÀ
Chairman: Renato Donfrancesco, Associate Professor of Paediatrics Università degli Studi "Tor Vergata"
Marianna Gino, Professor Assistant of Neuropsychiatry Infantile, Università "Tor Vergata"

I fondamenti teorico-praktici
14.30 Giorgetta Sereni, Assegnista di Paediatrica, Università degli Studi "Tor Vergata"
La costruzione di un'identità unica: un approccio seriale dell'individualità
15.00 Giovanni Augugliaro, Psicoterapeuta, Roma
L'aspettativa come conoscenza dalla diagnosi e differenze individuali

L'esperienza individuale
15.30 Enzo Sechi, Professor Associato di Neuropsichiatria infantile, Università degli Studi "L'Aquila"
Dal fenomeno all'encefonte: verso la costruzione di una diagnosi clinica
16.00 Michelle Di Tondi, Dipartimento di Psicologia e Clinica, Università di Roma "La Sapienza"
Oltre le diagnostiche: il ruolo delle emozioni

L'ambiente e le relazioni
16.30 Giovanni Comneni, Direttore del Servizio, Psichiatria infantile dell'ospedale "L'Assessment of Parents' Skills Interview": uno strumento per la valutazione di potenzialità
17.00 Dr. Andrea, Liceo Scientifico, Roma
Il temperamento nella diagnosi in via evolutiva: uno sguardo all'esperienza soggettiva e alle rappresentazioni interrelazionali

17.30 Conclusioni e Questionario ECM

41
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 discusso nell’ambito della EUNETHYDIS 2nd International ADHD Conference che si terrà a Barcellona il 23-25 Maggio.


Alessandro Zuddas, Maurizio Bonati, Antonella Costantino, Gabriele Masi, Pietro Panei
Per ricevere la newsletter iscriversi al seguente indirizzo:
http://crc.marionegri.it/bonati/adhdnews/subscribe.html

Iniziativa nell’ambito del Progetto di Neuropsichiatria dell’Infanzia e dell’Adolescenza
Il Progetto è realizzato con il contributo, parziale, della Regione Lombardia
(in attuazione della D.G. sanità n. 3250 del 11/04/2011)
Capofila Progetto: UO NPIA Azienda Ospedaliera “Spedali Civili di Brescia”
“Condivisione dei percorsi diagnostico-terapeutici per l’ADHD in Lombardia”.

ISTITUTO DI RICERCHE FARMACOLOGICHE MARIO NEGRI
DIPARTIMENTO DI SALUTE PUBBLICA
Laboratorio per la Salute Materno Infantile
Via Giuseppe La Masa, 19 - 20156 Milano MI - Italia - www.marionegri.it
tel +39 02 39014.511 - fax +39 02 3550924 - mother_child@marionegri.it