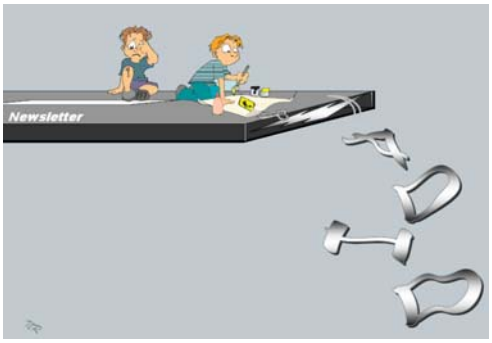

ADHD
ATTENTION DEFICIT HYPERACTIVITY DISORDER

Laboratorio per la Salute Materno Infantile

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Neuropharmacology. 2009;57:702-07.

Acute atomoxetine effects on the EEG of children with Attention-Deficit/Hyperactivity Disorder.

Barry RJ, Clarke AR, Hajos M, et al.

Although stimulant medications are the most commonly-used treatments for Attention-Deficit/Hyperactivity Disorder (AD/HD), as many as 20% of treated children do not respond clinically to stimulants. This study investigated the effects of an acute dose of atomoxetine, a selective noradrenaline reuptake inhibitor (SNRI), on the electroencephalogram (EEG) and performance of children with AD/HD. An initial pre-medication EEG was recorded during an eyes-closed resting condition. Within two weeks, a second EEG was recorded 1 h after ingestion of 20 mg of atomoxetine. Data were Fourier transformed to provide absolute and relative power estimates for the delta, theta, alpha, beta and gamma bands. Compared to controls, the unmedicated AD/HD children had significantly elevated global absolute and relative delta, with reduced global relative alpha, and absolute and relative gamma, and many topographic differences. Atomoxetine produced significant global increases in absolute and relative beta, with several topographic changes in other bands, and a significant reduction in omission errors on a Continuous Performance Task. These results indicate that SNRIs can produce substantial normalisation of the AD/HD EEG profile, together with behavioural performance improvements. Although EEG changes induced by acute administration of psychostimulants (methylphenidate/dexamphetamine) and atomoxetine are not identical, both classes of AD/HD drugs produce similar EEG band changes. Further analysis of EEG responses to SNRIs and psychostimulants could reveal common neurophysiological processes closely linked to clinical improvement of AD/HD symptoms in response to pharmacotherapy, providing translational markers for clinical efficacy studies and potential translational biomarkers for AD/HD drug discovery.

Arch Gen Psychiatry. 2009;66:1135-42.

Dopaminergic haplotype as a predictor of spatial inattention in children with attention-deficit/hyperactivity disorder.

Bellgrove MA, Johnson KA, Barry E, et al.

Context: A distinct pattern of selective attention deficits in attention-deficit/hyperactivity disorder (ADHD) has been difficult to identify. Heterogeneity may reflect differences in underlying genetics.

Objective: To document an objective deficit of selective attention in a large sample of children with and without ADHD using spatial orienting paradigms. By stratifying samples according to the gene dosage of a risk haplotype of the dopamine transporter gene (DAT1), we could determine whether genetic factors predict spatial inattention in ADHD.

Design: A case-control design was used.

Setting: Children with ADHD were recruited from clinics or support groups in Ireland. Typically developing children were recruited from schools in and around Dublin, Ireland.

Participants: One hundred fifteen children were recruited (ADHD=50, control=65). Groups were matched for age but differed in estimated intelligence.

Intervention: Two versions of a visual spatial orienting task in which attention was directed by valid, neutral, or invalid cues to target locations. Sudden-onset peripheral cues (exogenous) and centrally presented predictive cues (endogenous) were used.

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

Main Outcome Measures: To isolate an attention deficit in ADHD, groups were first compared using analysis of variance on the spatial orienting tasks. Multiple regression was used to assess the main effect of DAT1 haplotype status (heterozygous vs homozygous) and the interaction of diagnosis and genotype on those variables that discriminated children with and without ADHD.
Results: Children with ADHD displayed deficits in reorienting attention from invalidly cued spatial locations, particularly for targets in the left visual field. DAT1 haplotype status predicted spatial reorienting deficits for left visual field targets (P=.007) but there was also a significant interaction of diagnosis and genotype (P=.02), which revealed the greatest impairment in children with ADHD homozygous for the DAT1 haplotype.
Conclusion: Heterogeneity in selective attention in ADHD can be explained by a replicated genetic risk factor for ADHD, the 10/3 DAT1 haplotype.

J Affective Disord. 2009;119:16-21.
Risk for switch from unipolar to bipolar disorder in youth with ADHD: A long term prospective controlled study.
Biederman J, Petty CR, Byrne D, et al.
Background: To investigate whether ADHD is a risk factor for switches from unipolar to bipolar disorder over time.
Methods: Data from two large controlled longitudinal family studies of boys and girls with and without ADHD and their siblings were used. Subjects (n = 168) were followed prospectively and blindly over an average follow-up period of 7 years. Comparisons were made between youth with unipolar major depression who did and did not switch to full or subthreshold BP-I disorder at the follow-up assessment. Subjects were assessed at baseline and follow-up on multiple domains of functioning. Positive family history of parental psychiatric disorders was also compared between groups.
Results: ADHD was associated with a significantly higher risk for switches from unipolar to bipolar disorder (28% versus 6%; z = 2.80, p = 0.005). In subjects with ADHD, switches from unipolar to bipolar disorder were predicted by baseline comorbid conduct disorder, school behavior problems, and a positive family history of parental mood disorder.
Limitations: Psychosis was an exclusionary criterion in the original ascertainment of the studies of ADHD probands, so we were unable to test this as a predictor of switching to BPD.
Conclusions: ADHD is a risk factor for switches from unipolar to bipolar disorder, and switches could be predicted by the presence of baseline conduct disorder, school behavior problems, and a positive family history of a mood disorder in a parent. These characteristics can aid clinicians in their treatment of youth with MDD.

Journal of the American Academy of Child & Adolescent Psychiatry. 2009 Sep;48:884-93.
Meta-analysis: Treatment of attention-deficit/hyperactivity disorder in children with comorbid tic disorders.
Bloch MH, Panza KE, Landeros-Weisenberger A, et al.
Objective: The Food and Drug Administration currently requires the package inserts of most psychostimulant medications to list the presence of a tic disorder as a contraindication to their use. Approximately half of children with Tourette's syndrome experience comorbid attention-deficit/hyperactivity disorder (ADHD). We sought to determine the relative efficacy of different medications in treating ADHD and tic symptoms in children with both Tourette's syndrome and ADHD.
Method: We conducted a PubMed search to identify all double-blind, randomized, placebo-controlled trials examining the efficacy of medications in the treatment of ADHD in the children with comorbid tics. We used a random effects meta-analysis with standardized mean difference as our primary outcome to estimate the effect size of pharmaceutical agents in the treatment of ADHD symptoms and tics.
Results: Our meta-analysis included nine studies involving 477 subjects. We assessed the efficacy of six medications' dextroamphetamine, methylphenidate, alpha-2 agonists (clonidine and guanfacine), desipramine, atomoxetine, and deprenyl. Methylphenidate, alpha-2 agonists, desipramine, and atomoxetine demonstrated efficacy in improving ADHD symptoms in children with comorbid tics. Alpha-2 agonists and atomoxetine significantly improved comorbid tic symptoms. Although there was evidence that

supratherapeutic doses of dextroamphetamine worsens tics, there was no evidence that methylphenidate worsened tic severity in the short term.
Conclusions: Methylphenidate seems to offer the greatest and most immediate improvement of ADHD symptoms and does not seem to worsen tic symptoms. Alpha-2 agonists offer the best combined improvement in both tic and ADHD symptoms. Atomoxetine and desipramine offer additional evidence-based treatments of ADHD in children with comorbid tics. Supratherapeutic doses of dextroamphetamine should be avoided.

J Affective Disord. 2009;117:208-11.
The use of lithium, valproate or lamotrigine for psychiatric conditions in children and adolescents in Norway 2004-2007 - A prescription database study.
Bramness JG, Groholt B, Engeland A, et al.
Background: There is an increasing awareness of bipolar disorder in children and adolescents. Our study aimed to explore how common the use of lithium, valproate and lamotrigine in psychiatric conditions in children and adolescents in Norway and to describe concomitant use of other psychotropic drugs.
Methods: The Norwegian Prescription Database (NorPD) captures all prescriptions given to individuals in ambulatory care. We investigated prescriptions for lithium, and for valproate and lamotrigine given for psychiatric conditions to children and adolescents under the age of 18 years from 2004 till 2007. We also studied other prescriptions for psychotropic drugs given to the same patients during the period. A comparison was made with the users of ADHD medication.
Results: The number below 18 years treated with lithium, valproate or lamotrigine rose from 323 (0.03%) in 2004 till 454 (0.04%) in 2007. Lamotrigine increased most rapidly and lithium was most infrequently used. The users of the three drugs had often also tried antidepressants (14-42%) and atypical antipsychotics (21-51%), but true concomitant use was rarer (7-20% and 16-43% respectively). The users of ADHD medication had a much lower use of other psychotropic drugs, but quite a few users of lithium, valproate and lamotrigine had tried ADHD medication (20-26%) and even used these drugs concomitantly (15-21%).
Limitations: NorPD does not include diagnoses, and we do not know if the drugs dispensed were actually used.
Conclusion: Overall there has been a slight increase in the use of lamotrigine in Norway during the last four years, most likely prescribed as a mood stabilizer in bipolar disorders. Still the use among the under 14-year-olds is rare in Norway.

Biol Psychiatry. 2009;66:972-77.
Ventro-Striatal Reductions Underpin Symptoms of Hyperactivity and Impulsivity in Attention-Deficit/Hyperactivity Disorder.
Carmona S, Proal E, Hoekzema EA, et al.
Background: Models of attention-deficit/hyperactivity disorder (ADHD) classically emphasize the relevance of executive processes and, recently, reward circuits. The neural bases of reward processes have barely been explored in relation to this disorder, in contrast to extensive neuroimaging studies that examine executive functions in patients with ADHD. To our knowledge, no previous studies have analyzed the volume of the ventral striatum, a key region for reward processes in ADHD children.
Methods: We used a manual region-of-interest approach to examine whether there were volumetric differences in the ventral striatum of ADHD children. Forty-two children/adolescents with ADHD (ages 6-18), and 42 healthy control subjects matched on age, gender, and handedness were selected for the study.
Results: The ADHD children presented significant reductions in both right and left ventro-striatal volumes ($t = 3.290$, $p = .001$; and $t = 3.486$, $p = .001$, respectively). In addition, we found that the volume of the right ventral striatum negatively correlated with maternal ratings of hyperactivity/impulsivity ($r = -.503$, $p = .003$).
Conclusions: Our study provides neuroanatomical evidence of alterations in the ventral striatum of ADHD children. These findings coincide with previous explicative models as well as with recent reports in behavioral and functional neuroimaging studies. Furthermore, the negative correlations we observed strongly uphold the relation between the ventral striatum and symptoms of hyperactivity/impulsivity.

Res Dev Disabil. 2009 Nov;30:1468-80.
A comparison of patterns of sensory processing in children with and without developmental disabilities.
Cheung PPP, Siu AMH.
This study compared the patterns of sensory processing among children with autism spectrum disorder (ASD), attention deficit and hyperactivity disorder (ADHD), and children without disabilities. Parents reported on the frequency of sensory processing issues by completing the Chinese Sensory Profile (CSP). Children with disabilities (ASD or ADHD) exhibited significantly more sensory processing issues than children without disabilities. The results of GLM and discriminant analyses showed that the CSP effectively differentiated between children with and without developmental disabilities. But it failed to identify major differences in sensory processing issues between children with either ASD or ADHD. Sensory processing issues could be one of many criteria that characterize and differentiate the features of children with different developmental disabilities. Although no significant gender differences in sensory processing issues appeared, age was a significant cofounding factor in evaluating sensory processing. Children without disabilities showed some small decreases in sensory processing issues as they aged from 6 to 12 years old. Children with ASD showed some decrease in sensory processing issues over the span of their childhood, while children with ADHD showed a significant increase in auditory processing issues as well as small increases in many aspects of sensory processing.

J Child Adolesc Psychopharmacol. 2009;19:351-61.
Efficacy and safety of dexmethylphenidate extended-release capsules administered once daily to children with attention-deficit/hyperactivity disorder.
Childress AC, Spencer T, Lopez F, et al.
Objective: This 5-week, multicenter, double-blind, placebo-controlled, parallel-group investigation is the first fixed-dose study to evaluate efficacy and tolerability of three doses of (10, 20, or 30 mg, once daily [o.d.]) dexmethylphenidate hydrochloride (HCl) extended-release (d-MPH XR; Focalin(registered trademark) XR) across multiple settings to treat pediatric attention-deficit/hyperactivity disorder (ADHD).
Results: ADHD pediatric outpatients (n = 253) diagnosed according to Diagnostic and Statistical Manual of Mental Disorders, 4 th edition, criteria were randomized (1:1:1:1) to receive d-MPH XR (10, 20, or 30 mg o.d.) or placebo. Treatment with d-MPH XR significantly ($p < 0.001$) reduced the mean score (change from baseline) on Conners'-ADHD/DSM-IV Scales (CADS) as assessed by the teacher CADS-T (dose [mean];10 mg [18], 20 mg [16.9], 30 mg [20.7]) and parents, CADS-P (dose [mean];10 mg [15.8]; 20 mg [17.8]; 30 mg [20.5]) compared to placebo (mean CADS-T [5.7]; CADS-P [4.6]). A significant ($p < 0.001$) proportion of patients in the three d-MPH XR treatment groups showed improvement on the clinician-rated, Clinical Global Impressions-Improvement (CGI-I) scales (10 mg [73.8%]; 20 mg [71.2%]; 30 mg [77.2 %]) and severity ratings (CGI-S) compared to the placebo group (CGI-I, 22.2%). Adverse events were mild to moderate in severity and similar to previous observations for this class of neurostimulants.
Conclusion: All three doses of d-MPH XR (10, 20, or 30 mg o.d), were significantly more effective than placebo in improving ADHD symptoms as confirmed by the teacher, parent and clinician. Additionally, d-MPH XR was well tolerated and demonstrated a consistent safety profile.

Journal of the American Academy of Child & Adolescent Psychiatry. 2009 Sep;48:894-908.
Sleep in children with attention-deficit/ hyperactivity disorder: Meta-analysis of subjective and objective studies.
Cortese S, Faraone SV, Konofal E, et al.
Objective: To perform a meta-analysis of subjective (i.e., based on questionnaires) and objective (i.e., using polysomnography or actigraphy) studies comparing sleep in children with attention-deficit/hyperactivity disorder (ADHD) versus controls.
Method: We searched for subjective and objective sleep studies (1987-2008) in children with ADHD (diagnosed according to standardized criteria). Studies including subjects pharmacologically treated or with comorbid anxiety/depressive disorders were excluded.

Results: Sixteen studies, providing 9 subjective and 15 objective parameters and including a total pooled sample of 722 children with ADHD versus 638 controls, were retained. With regard to subjective items, the meta-analysis indicated that children with ADHD had significantly higher bedtime resistance ($z = 6.94$, $p < .001$), more sleep onset difficulties ($z = 9.38$, $p < .001$), night awakenings ($z = 2.15$, $p = .031$), difficulties with morning awakenings ($z = 5.19$, $p < .001$), sleep disordered breathing ($z = 2.05$, $p = .040$), and daytime sleepiness ($z = 1.96$, $p = .050$) compared with the controls. As for objective parameters, sleep onset latency (on actigraphy), the number of stage shifts/hour sleep, and the apnea-hypopnea index were significantly higher in the children with ADHD compared with the controls ($z = 3.44$, $p = .001$; $z = 2.43$, $p = .015$; $z = 3.47$, $p = .001$, respectively). The children with ADHD also had significantly lower sleep efficiency on polysomnography ($z = 2.26$, $p = .024$), true sleep time on actigraphy ($z = 2.85$, $p = .004$), and average times to fall asleep for the Multiple Sleep Latency Test ($z = 6.37$, $p < .001$) than the controls.
Conclusions: The children with ADHD are significantly more impaired than the controls in most of the subjective and some of the objective sleep measures. These results lay the groundwork for future evidence-based guidelines on the management of sleep disturbances in children with ADHD.

Rev Psiquiatr Clin. 2009;36:101-04.
Agreement rates between parents' and teachers' reports on ADHD symptomatology: Findings from a Brazilian clinical sample.
Coutinho G, Mattos P, Schmitz M, et al.
Background: ADHD diagnosis in children and adolescents according to DSM-IV criteria demands symptoms to be present in at least two different settings (mainly school and home). Despite the importance in obtaining parents' and teachers' reports, this issue is seldom investigated in Brazil.
Objective: We set to evaluate agreement rates between parents' and teachers' reports from a Brazilian clinical sample of children and adolescents with ADHD.
Methods: The sample comprised 44 children and adolescents with age range between 6 and 16 years old (boys: 40; girls: 4) with a clinical diagnosis of ADHD. We compared parents' and teachers' responses in SNAP-IV questionnaire in order to calculate agreement rates among different information sources on ADHD symptomatology.
Results: Agreement for ADHD diagnosis occurred in nearly half of the sample, with parents' reporting more ADHD symptomatology than teachers.
Conclusion: Our findings might suggest that recognition of ADHD symptomatology is less clear-cut among school teachers in Brazil, indicating that some educational sessions about this condition should be conducted in schools, taking into consideration the importance of education professionals' reports to diagnose ADHD

Eur Neuropsychopharmacol. 2009;19:822-34.
Atomoxetine hydrochloride in the treatment of children and adolescents with attention-deficit/hyperactivity disorder and comorbid oppositional defiant disorder: A placebo-controlled Italian study.
Dell'Agnello G, Maschietto D, Bravaccio C, et al.
Objective: The primary aim of this study was to assess the efficacy of atomoxetine in improving ADHD and ODD symptoms in paediatric patients with ADHD and comorbid oppositional defiant disorder (ODD), non-responders to previous psychological intervention with parent support.
Methods: This was a multicentre, randomised, placebo-controlled trial conducted in patients aged 6-15 years, with ADHD and ODD diagnosed according to the DSM-IV criteria by a structured clinical interview (K-SADS-PL). Only subjects who are non-responders to a 6-week standardized parent training were randomised to atomoxetine (up to 1.2 mg/kg/day) or placebo (in a 3:1 ratio) for the following 8-week double blind phase.
Results: Only 2 of the 156 patients enrolled for the parent support phase (92.9% of males; mean age: 9.9 years), improved after the parent training program; 139 patients were randomised for entering in the study and 137 were eligible for efficacy analysis. At the end of the randomised double blind phase, the mean changes in the Swanson, Nolan and Pelham Rating Scale-Revised (SNAP-IV) ADHD subscale were - 8.1 (plus or minus) 9.2 and - 2.0 (plus or minus) 4.7, respectively in the atomoxetine and in the placebo group ($p < 0.001$ between groups); changes in the ODD subscale were - 2.7 (plus or minus) 4.1 and - 0.3 (plus or

minus) 2.6, respectively in the two groups (p = 0.001 between groups). The CGI-ADHD-S score decreased in the atomoxetine group (median change at endpoint: - 1.0) compared to no changes in the placebo group (p < 0.001 between groups). Statistically significant differences between groups, in favour of atomoxetine, were found in the CHIP-CE scores for risk avoidance domain, emotional comfort and individual risk avoidance subdomains. An improvement in all the subscales of Conners Parents (CPRS-R:S) and Teacher (CTRS-R:S) subscales was observed with atomoxetine, except in the cognitive problems subscale in the CTRS-R:S. Only 3 patients treated with atomoxetine discontinued the study due to adverse events. No clinically significant changes of body weight, height and vital signs were observed in both groups.
Conclusions: Treatment with atomoxetine of children and adolescents with ADHD and ODD, who did not initially respond to parental support, was associated with improvements in symptoms of ADHD and ODD, and general health status. Atomoxetine was well tolerated.

Child Adolesc Psychiatry Ment Health. 2009;3:21.
Atomoxetine treatment and ADHD-related difficulties as assessed by adolescent patients, their parents and physicians.
Dittmann RW, Wehmeier PM, Schacht A, et al.
Background: The degree of ADHD-related difficulties - reflecting overall impairment, social functioning, and quality of life - may be perceived differently by adolescent patients, parents and physicians. The primary aim of this study was to investigate ADHD-related difficulties during atomoxetine treatment, as perceived by the three different raters. Secondary objectives focused on effectiveness and tolerability of atomoxetine treatment in a population of adolescent patients with ADHD.
Methods: Adolescents with ADHD, aged 12-17 years, received open-label atomoxetine (0.5-1.2 mg/kg/day) up to 24 weeks. ADHD-related difficulties at various times of the day were rated using the Global Impression of Perceived Difficulties (GIPD) instrument. Inter-rater agreement was analyzed using Cohen's Kappa with 95% confidence intervals (95% CI). ADHD-Rating Scale (ADHD-RS) and Clinical Global Impression Severity (GGI-S) scores were assessed by the investigator; and spontaneous adverse events, vital signs and laboratory parameters were collected for tolerability assessments.
Results: 159 patients received atomoxetine. Patients' baseline mean GIPD total ratings were significantly lower than parents' and physicians' scores (12.5 [95%CI 11.6;13.5] vs. 17.2 [16.2;18.2] and 18.8 [17.8;19.8]). For all raters, GIPD scores significantly improved over time. Changes were greatest within the first two weeks. Kappa coefficients varied between 0.186 [0.112;0.259] and 0.662 [0.529;0.795], with strongest agreements between parent and physician assessments, and significant improvements of patient/physician agreements over time (based on 95% CIs). ADHD-RS and CGI-S scores significantly improved over the course of the study (based on 95% CIs). Tolerability results were consistent with earlier reports.
Conclusion: ADHD-related difficulties were perceived differently by the raters in this open-label trial, but consistently improved during atomoxetine treatment. The GIPD instrument appeared sensitive to treatment-related change. These primarily quantitative findings may guide future studies to more systematically investigate the clinical and practical relevance of the differences observed. Additionally, in order to further validate these results, placebo- and comparator-controlled trials are recommended as well as inclusion of healthy controls and other patient populations. Trial Registration: Clinical Trial Registry: ClinicalTrials.gov: NCT00191737.

Assessment for Effective Intervention. 2009 Sep;34:231-41.
An investigation of the technical adequacy of a Daily Behavior Report Card (DBRC) for monitoring progress of students with attention-deficit/hyperactivity disorder in special education placements.
Fabiano GA, Vujnovic R, Naylor J, et al.
Many children with attention-deficit/hyperactivity disorder (ADHD) are eligible for special education services because of problems with academic and/or social functioning. Thus, a considerable proportion of children with ADHD have individualized education plans (IEPs) that list operationalized goals and objectives for each student. Conceptually, the majority of these children fall within Tiers 2 and 3 of a tiered intervention system because of a need for more intensive behavioral supports. Given the potentially variable behavior of these students in classroom settings and a concurrent need to demonstrate the effectiveness of intervention outcomes, frequent and sustained monitoring of goals and objectives is necessary. For this purpose, direct

behavior rating scales such as a Daily Behavior Report Card (DBRC) may serve as an efficient and effective mechanism for progress monitoring. In a sample of 63 students with ADHD receiving special education services, initial psychometric information for the temporal stability, interrater reliability, and content validity of an idiographic, multi-item DBRC is presented. Procedures for integrating a DBRC into standard progress monitoring procedures likely to be useful in intervention monitoring at Tiers 2 and 3 are discussed.

J Mental Health Policy Econ. 2009;12:119-68+171.
Long-term consequences of childhood adhd on criminal activities.
Fletcher J, Wolfe B.
Background: Attention Deficit/Hyperactivity Disorder (ADHD) is one of the most prevalent mental health problems facing children. Little is known of the long-term consequences of ADHD on young adult outcomes.
Aims of the Study: We examine the associations between childhood ADHD symptoms and criminal activities as a young adult.
Methods: We use a nationally representative study of US adolescents and logistic regression analysis to examine our research question. We also control for common family factors using sibling random and fixed effects and test the robustness of our results in several ways.
Results: The empirical estimates show that children who experience ADHD symptoms face a substantially increased likelihood of engaging in many types of criminal activities. An included calculation of the social costs associated with criminal activities by individuals with childhood ADHD finds the costs to be substantial.
Discussion: Our study provides the first evidence using a nationally representative dataset of the long term consequences on criminal activities of childhood ADHD. Our results are quite robust to a number of specification checks. Limitations of our study include that our measures of ADHD are retrospective, we have no information on treatment for ADHD, and it remains possible that our results are confounded by unmeasured variables.
Implications: Our results suggest that children showing ADHD symptoms should be viewed as a group at high risk of poor outcomes as young adults. As such, a good case can be made for targeting intervention programs on this group of children and conducting evaluations to learn if such interventions are effective in reducing the probability that these children commit a crime. Development of such intervention programs and evaluating them for efficiency could be dollars well spent in terms of crime and drug abuse averted.

J Autism Dev Disord. 2009;39:1542-51.
Association of COMT (Val158Met) and BDNF (Val66Met) gene polymorphisms with anxiety, ADHD and tics in children with autism spectrum disorder.
Gadow KD, Roohi J, DeVincent CJ, et al.
The aim of the study is to examine rs4680 (COMT) and rs6265 (BDNF) as genetic markers of anxiety, ADHD, and tics. Parents and teachers completed a DSM-IV-referenced rating scale for a total sample of 67 children with autism spectrum disorder (ASD). Both COMT (p = 0.06) and BDNF (p = 0.07) genotypes were marginally significant for teacher ratings of social phobia ((eta)p2 = 0.06). Analyses also indicated associations of BDNF genotype with parent-rated ADHD (p = 0.01, (eta)p 2 = 0.10) and teacher-rated tics (p = 0.04; (eta)p 2 = 0.07). There was also evidence of a possible interaction (p = 0.02, (eta)p 2 = 0.09) of BDNF genotype with DAT1 3VNTR with tic severity. BDNF and COMT may be biomarkers for phenotypic variation in ASD, but these preliminary findings remain tentative pending replication with larger, independent samples.

Int J Psychophysiol. 2009;74:149-57.
Distinct EEG effects related to neurofeedback training in children with ADHD: A randomized controlled trial.
Gevensleben H, Holl B, Albrecht B, et al.
In a randomized controlled trial, neurofeedback (NF) training was found to be superior to a computerised attention skills training concerning the reduction of ADHD symptomatology (Gevensleben et al., 2009). The

aims of this investigation were to assess the impact of different NF protocols (theta/beta training and training of slow cortical potentials, SCPs) on the resting EEG and the association between distinct EEG measures and behavioral improvements. In 72 (of initially 102) children with ADHD, aged 8-12, EEG changes after either a NF training (n = 46) or the control training (n = 26) could be studied. The combined NF training consisted of one block of theta/beta training and one block of SCP training, each block comprising 18 units of 50 minutes (balanced order). Spontaneous EEG was recorded in a two-minute resting condition before the start of the training, between the two training blocks and after the end of the training. Activity in the different EEG frequency bands was analyzed. In contrast to the control condition, the combined NF training was accompanied by a reduction of theta activity. Protocol-specific EEG changes (theta/beta training: decrease of posterior-midline theta activity; SCP training: increase of central-midline alpha activity) were associated with improvements in the German ADHD rating scale. Related EEG-based predictors were obtained. Thus, differential EEG patterns for theta/beta and SCP training provide further evidence that distinct neuronal mechanisms may contribute to similar behavioral improvements in children with ADHD.

J Child Adolesc Psychopharmacol. 2009;19:329-39.

Randomized, placebo-controlled, crossover study of methylphenidate for attention-deficit/hyperactivity disorder symptoms in preschoolers with developmental disorders.

Ghuman JK, Aman MG, Lecavalier L, et al.

Objective: The aim of this study was to investigate the short-term efficacy and safety of methylphenidate (MPH) to treat attention-deficit/hyperactivity disorder (ADHD) symptoms in an understudied population of preschoolers with pervasive developmental disorder (PDD) or intellectual disability (ID).

Methods: Fourteen preschoolers with developmental disorders (DD, n = 14; PDD, n = 12; ID, n = 2) underwent MPH titration in a single-blind manner followed by a 4-week double-blind crossover phase. Each child was administered placebo for 2 weeks and "optimal dose" for 2 weeks. The primary outcome measure was the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) ADHD subscale of the Conners' Parent Rating Scale-Revised (CPRS-R-DSM-IV-ADHD).

Results: MPH improved parent-rated ADHD symptoms of the preschoolers; 50% were rated as responders. The CPRS-R-DSM-IV-ADHD subscale was significant for the PDD subgroup (p = 0.005, Cohen d = 0.97) and marginally significant for the entire DD sample (p = 0.08, Cohen d = 0.50). Half of the preschoolers experienced side effects with MPH, including reports of increased stereotypic behavior, upset stomach, sleep-related difficulties, and emotional lability. One child discontinued during titration due to side effects.

Conclusion: The predominant direction of response in these preschoolers with both ADHD and PDD/ID favored MPH, even though the response was more subtle and variable than in older and typically developing children. Due to high rates of adverse effects, preschoolers should be monitored closely.

Clin Neuropharmacol. 2009;32:239-42.

Influence of methylphenidate treatment on smoking behavior in adolescent girls with attention-deficit/hyperactivity and borderline personality disorders.

Golubchik P, Sever J, Weizman A.

Background: Cigarette smoking and nicotine dependence are prevalent among pediatric populations with attention-deficit/hyperactivity disorder (ADHD). We assessed the impact of methylphenidate (MPH) treatment on the smoking behavior of adolescent girls with ADHD/borderline personality disorder (BPD).

Method: Twelve female adolescent smokers with ADHD/BPD aged 14 to 19 years were treated with MPH for an 8-week period. The severity of ADHD was assessed by the ADHD Rating Scale (ADHD-RS), whereas the smoking behavior was rated by Fagerstorm Test for Nicotine Dependence (FTND).

Results: Significant improvement was detected in ADHD symptoms (ADHD-RS, mean [SD], baseline vs end point: 33.1 [6.8] vs 19.9 [6.8], t = 6.875, df = 11, P = 0.0001). A decline, as assessed by FTND (baseline vs end point: 4.1 [2.6] vs 2.0 [1.9], t = 4.056, df = 11, P = 0.0019), was observed in the severity of nicotine dependence. No significant correlation was found between changes in the ADHD-RS and the FTND after MPH treatment (r = 0.09935, P = 0.7587).

Conclusions: Methylphenidate may attenuate smoking behavior in female adolescent smokers with ADHD/BPD.

Alcohol Clin Exp Res. 2009;33:1656-70.
Social cognitive and emotion processing abilities of children with fetal alcohol spectrum disorders: A comparison with attention deficit hyperactivity disorder.
Greenbaum RL, Stevens SA, Nash K, et al.
Background: Although children with Fetal Alcohol Spectrum Disorders (FASDs) are at high risk of attention deficit hyperactivity disorder (ADHD), direct comparisons show distinct cognitive phenotypes in the 2 diagnoses. However, these groups have not been directly compared for social problems or social cognition, nor has social cognition been directly examined in FASDs.
Objectives: To compare FASDs and ADHD groups on social cognition tasks and determine whether deficient social cognition and emotion processing predict behavioral problems and social skills.
Methods: Studied were 33 children with FASDs, 30 with ADHD, and 34 normal controls (NC). All received tasks of social cognition and emotion processing. Parents and teachers rated children on measures of completed questionnaires assessing child's behavioral problems and social skills using the Child Behavior Checklist, Teacher Report Form, and Social Skills Rating Scale. Children received 3 subtests from the Saltzman-Benaiah and Lalonde (2007) Theory of Mind Task as a measure of social cognition and 4 subtests from the Minnesota Test of Affective Processing (Lai et al., 1991) to assess emotion processing.
Results: Parents and teachers reported more behavior problems and poorer social skills in children in FASD and ADHD than NC groups. FASDs demonstrated significantly weaker social cognition and facial emotion processing ability than ADHD and NC groups. Regression analyses identified social cognition as a significant predictor of behavior problems and emotion processing as a significant predictor of social skills.
Conclusions: Children with FASDs show a distinct behavioral profile from children with ADHD. Difficulties in social cognition and emotion processing in children with FASDs may contribute to their high incidence of social behavioral problems.

Biol Psychol. 2009 Sep;82:45-53.
Methylphenidate improves diminished error and feedback sensitivity in ADHD: An Evoked Heart Rate analysis.
Groen Y, Mulder LJM, Wijers AA, et al.
Attention Deficit Hyperactivity Disorder (ADHD) is a developmental disorder that has previously been related to a decreased sensitivity to errors and feedback. Supplementary to the traditional performance measures, this study uses autonomic measures to study this decreased sensitivity in ADHD and the modulating effects of medication. Children with ADHD, on and off Methylphenidate (Mph), and typically developing (TD) children performed a selective attention task with three feedback conditions: reward, punishment and no feedback. Evoked Heart Rate (EHR) responses were computed for correct and error trials. All groups performed more efficiently with performance feedback than without. EHR analyses, however, showed that enhanced EHR decelerations on error trials seen in TD children, were absent in the medication-free ADHD group for all feedback conditions. The Mph-treated ADHD group showed normalised EHR decelerations to errors and error feedback, depending on the feedback condition. This study provides further evidence for a decreased physiological responsiveness to errors and error feedback in children with ADHD and for a modulating effect of Mph.

Int J Neuropsychopharmacol. 2009;12:709-14.
MAOA is associated with methylphenidate improvement of oppositional symptoms in boys with attention deficit hyperactivity disorder.
Guimares AP, Zeni C, Polanczyk G, et al.
The monoamine oxidase A (MAOA) gene has been extensively related to aggressive, impulsive and violent behaviours. Previous studies have documented the improvement of oppositional symptoms in attention deficit hyperactivity disorder (ADHD) patients with methylphenidate (MPH). However, the effect of the MAOA gene in response to MPH has not been investigated. A sample of 85 boys from an ADHD outpatient service was genotyped for the MAOA-uVNTR polymorphism. The outcome measure was the parent-rated oppositional subscale of the Swanson, Nolan and Pelham Scale version IV. The scale was applied by child psychiatrists blinded to genotype at baseline and in the first and third months of treatment. A significant interaction between the presence of MAOA high-activity genotype and treatment with MPH over time on

oppositional scores was detected during the 3 months' treatment (n=85, F2,136=4.83, p=0.009). These results suggest an effect of the MAOA-uVNTR high-activity genotype on the improvement of oppositional symptoms with MPH treatment.

Int J Neuropsychopharmacol. 2009;12:701-07.
Intact sensorimotor gating in adult attention deficit hyperactivity disorder.
Hanlon MC, Karayanidis F, Schall U.
Disrupted sensorimotor gating has been found in various neuropsychiatric conditions which are characterized by impaired attention, poor impulse control, dysfunctional dopamine neurotransmission, and neurodevelopmental deficits. We investigated sensorimotor gating by prepulse inhibition (PPI) of the acoustic startle eyeblink reflex in 23 young adults diagnosed with attention deficit hyperactivity disorder (ADHD) as children and still symptomatic at the time of testing and 29 age-matched healthy control subjects. Sensorimotor gating was assessed in a passive listening task at prepulse-to-startle probe intervals of 30, 60, 120, 240, and 480 ms, and subsequently at prepulse-to-startle probe intervals of 60, 120, 240, and 480 ms whilst participants were performing a two-tone auditory discrimination task on the prepulse. Consistent with increased neural maturity and partially remitted symptomatology, our results indicate intact sensorimotor gating for both tasks in adult ADHD with no comorbidity, independent of the subjects' gender and whether ADHD subjects were receiving ongoing stimulant treatment or not. Reduced PPI at 120-ms lead intervals, on the other hand, was recorded in a subset of 10 ADHD subjects who were taken off their prescribed regular stimulants for 24 h and tested in a randomized counterbalanced order for on vs. off medication. However, our data remained inconclusive as to whether this observation constitutes beneficial treatment or acute stimulant withdrawal effects on sensorimotor gating.

Autism. 2009;13:485-509.
Which DSM-IV-TR criteria best differentiate high-functioning autism spectrum disorder from ADHD and anxiety disorders in older children?
Hartley SL, Sikora DM.
Diagnosis of autism spectrum disorder (ASD) is often delayed in high-functioning children with milder and more varied forms of ASD. The substantial overlap between ASD and other psychiatric disorders is thought to contribute to this delay. This study examined the endorsement of DSM-IV-TR diagnostic criteria for ASD based on semi-structured parent interviews across three groups of older children referred to an ASD clinic: 55 children diagnosed with high-functioning ASD, 27 children diagnosed with attention-deficit/hyperactivity disorder (ADHD), and 23 children diagnosed with anxiety disorder. Results indicate that the criteria within the domains of communication and social relatedness were largely able to discriminate the high-functioning ASD group from the ADHD and anxiety disorder groups, but criteria within the domain of restricted/repetitive/stereotyped patterns were not.

Progress in Neuro-Psychopharmacology & Biological Psychiatry. 2009 Aug;33:939-44.
Verbal but not performance IQ is highly correlated to externalizing behavior in boys with ADHD carrying both DRD4 and DAT1 risk genotypes.
Kebir O, Grizenko N, Sengupta S, et al.
Objective: Attention-deficit/hyperactivity disorder (ADHD) is often associated with reduced IQ and high levels of externalizing behavior (EB). This study tested if DRD4 7-repeat allele and DAT1 10-repeat allele homozygosity interact in modulating correlations between IQ and EB in affected boys.
Methods: Boys (n = 130) between 6 and 12 years of age diagnosed with ADHD were included in the study. IQ and EB were assessed by WISC-III and Child Behavioral Checklist, respectively. The 40 bp variable number tandem repeat (VNTR) of the DAT1 gene and the 48 bp VNTR of the DRD4 gene polymorphisms were genotyped and 4 subgroups were defined by the presence/absence of the DRD4 7-repeat allele and by the presence/absence of the DAT1 10/10 genotype. Correlation coefficients were compared using the Fisher's Z transformation and regression lines by a Potthoff analysis.

Results: In the total sample, all correlation coefficients between EB score and IQ were non significant. Also, no differences in IQ were observed between the 4 genotype groups. However, different pattern of correlations between IQ and EB score appeared. In boys carrying no or only one genetic risk, IQ and EB score were uncorrelated while in children carrying both risk factors, negative and significant correlations emerged. Notably, correlation of EB to verbal IQ was strong (r = -0.71) and highly significant (P < 0.01) in boys carrying both risk alleles. All pair-wise comparisons of correlation coefficients were significant for EB-verbal IQ correlation. Test of coincidence of regression lines did not show significant differences.
Conclusions: A specific domain of IQ, namely the verbal quotient is highly correlated to the level of EB in boys with ADHD carrying both dopaminergic risk genotypes. Further investigations are required to replicate these results and determine specificity to ADHD.

Brain Lang. 2009;111:46-54.
The pars triangularis in dyslexia and ADHD: A comprehensive approach.
Kibby MY, Kroese JM, Krebbs H, et al.
Limited research has been conducted on the structure of the pars triangularis (PT) in dyslexia despite functional neuroimaging research finding it may play a role in phonological processing. Furthermore, research to date has not examined PT size in ADHD even though the right inferior frontal region has been implicated in the disorder. Hence, one of the purposes of this study was to examine the structure of the PT in dyslexia and ADHD. The other purposes included examining the PT in relation to overall expressive language ability and in relation to several specific linguistic functions given language functioning often is affected in both dyslexia and ADHD. Participants included 50 children: 10 with dyslexia, 15 with comorbid dyslexia/ADHD, 15 with ADHD, and 10 controls. Using a 2 (dyslexia or not) null 2 (ADHD or not) MANCOVA, findings revealed PT length and shape were comparable between those with and without dyslexia. However, children with ADHD had smaller right PT lengths than those without ADHD, and right anterior ascending ramus length was related to attention problems in the total sample. In terms of linguistic functioning, presence of an extra sulcus in the left PT was related to poor expressive language ability. In those with adequate expressive language functioning, left PT length was related to phonological awareness, phonological short-term memory and rapid automatic naming (RAN). Right PT length was related to RAN and semantic processing. Further work on PT morphology in relation to ADHD and linguistic functioning is warranted.

Biol Psychiatry. 2009;66:958-63.
Phthalates Exposure and Attention-Deficit/Hyperactivity Disorder in School-Age Children.
Kim BN, Cho SC, Kim Y, et al.
Background: Very few studies have examined the association between attention-deficit/hyperactivity disorder (ADHD) and phthalate exposure in humans. The aim of this study was to investigate the impact of phthalates on symptoms of ADHD in school-age children.
Methods: A cross-sectional examination of urine phthalate concentrations was performed, and scores on measures of ADHD symptoms and neuropsychological dysfunction with regard to attention and impulsivity were obtained from 261 Korean children, age 8-11 years.
Results: Mono-2-ethylheyl phthalate (MEHP) and mono-2-ethyl-5-oxohexylphthalate (MEOP) for metabolites of Di-2-ethylhexylphthalate (DEHP) and mono-n-butyl phthalate (MNBP) for metabolites of dibutyl phthalate (DBP) were measured in urine samples. The mean concentrations of MEHP, MEOP, and MNBP were 34.0 (mu)g/dL (SD = 36.3; range: 2.1-386.7), 23.4 (mu)g/dL (SD = 23.0; range: .75-244.8), and 46.7 (mu)g/L (SD = 21.4; range: 13.2-159.3), respectively. After adjustment for covariates, teacher-rated ADHD scores were significantly associated with DEHP metabolites but not with DBP metabolites. We also found significant relationships between the urine concentrations of metabolites for DBP and the number of omission and commission errors in continuous performance tests (CPT) after adjustment for covariates.
Conclusion: The present study showed a strong positive association between phthalate metabolites in urine and symptoms of ADHD among school-age children.

Eur J Paediatr Neurol. 2009;13:516-23.
Effects of methylphenidate on working memory functioning in children with attention deficit/hyperactivity disorder.
Kobel M, Bechtel N, Weber P, et al.
Background and aims: Children with attention deficit/hyperactivity disorder (ADHD) often show deficits in working memory performance. Methylphenidate (MPH) is an effective medication to improve these cognitive difficulties. This study aimed to clarify which effect MPH induces on the underlying functional networks of working memory.
Methods: Fourteen boys diagnosed with ADHD and 12 healthy controls were investigated using functional magnetic resonance imaging (fMRI). Each patient was tested twice, once with medication and once without. The fMRI experiments consisted of three verbal N-back tasks with increasing difficulty. Functional images were acquired on a 3 Tesla head scanner.
Results: On the behavioral level, medicated patients performed similar to healthy controls and significantly better than without medication. On the functional level, patients showed the expected frontal and parietal activations, which were more pronounced in the 2- and 3-back tasks. Healthy controls showed significantly more activation in these regions and additional activation in the cerebellum. Interestingly, patients showed an additional effect of laterality. Left-sided frontal and parietal activation in patients was significantly less pronounced than in controls.
Conclusion: Functional data indicate different activation patterns in verbal working memory tasks between healthy controls and patients with ADHD irrespective of medication condition. Intake of MPH led to a clear improvement on a behavioral level. However, this effect was not reflected by changes in functional brain organization. MPH-induced changes leading to better performance in verbal working memory tasks might be very subtle and therefore not detectable by fMRI.

J Int Neuropsychol Soc. 2009;15:570-79.
Why cognitive performance in ADHD may not reveal true potential: Findings from a large population-based sample.
Kuntsi J, Wood AC, Van Der Meere J, et al.
Focusing on symptoms of attention deficit hyperactivity disorder (ADHD) in a sample obtained from the general population, we aimed to investigate the effects of incentives and event rate on reaction time (RT) performance and response inhibition. We assessed 1156 children, at a mean age of 8 years, on their performance on an inhibition task and a RT task under different experimental conditions that manipulated event rate and incentives. Children with high ADHD (ADHD-H) symptoms showed cognitive performance deficits only under some of the experimental conditions compared to a control group. The fast-incentive condition of the RT task succeeded in normalizing the RT variability, as well as the slow overall speed, in the ADHD-H group. Analyses of ADHD symptom scores as a quantitative trait in the total sample were overall consistent with these findings. The findings suggest that at least some cognitive performance deficits in children with high ADHD symptoms do not reflect stable cognitive deficits. The degree to which cognitive impairments in ADHD can be modulated by energetic or motivational factors has important implications for clinical and educational interventions.

J Child Psychol Psychiatry Allied Discip. 2009;50:1468-76.
Parent-child hostility and child ADHD symptoms: A genetically sensitive and longitudinal analysis.
Lifford KJ, Harold GT, Thapar A.
Background: Families of children with attention-deficit/hyperactivity disorder (ADHD) report higher rates of conflict within the family and more negative parent-child relationships. This study aimed to test whether negative parent-child relationships have a risk effect on ADHD symptoms using two complementary designs.
Method: The first sample included 886 twin pairs, aged 11-17 years, derived from a population-based twin study. The second sample was derived from a longitudinal community study and included 282 parents and their children, aged 11-14 years. Questionnaires were used to assess ADHD symptoms and hostility in the mother-child and father-child relationship. Bivariate genetic analysis was used to test the contribution of genetic and environmental factors to the association between parent-child hostility and ADHD symptoms in

the twin sample. Cross-lagged and reciprocal effects models were used to test for a bidirectional relationship between parent-child hostility and ADHD symptoms over time in the longitudinal study.
Results: For boys, both genetic and environmental factors contributed to the link between mother-son hostility and ADHD symptoms, but genetic factors alone explained the association between father-son hostility and ADHD symptoms. For girls, the association between ADHD symptoms and mother-daughter hostility as well as father-child hostility was attributed to genetic factors alone. The longitudinal study provided evidence of boys' ADHD symptoms impacting upon mother-son hostility both within and across time. There were no effects in the opposite direction.
Conclusions: A causal hypothesis of family relations influencing ADHD symptoms was not supported. Boys' ADHD symptoms appear to have an environmentally mediated impact upon mother-son hostility.

J Child Adolesc Psychopharmacol. 2009;19:461-65.
Do sluggish cognitive tempo symptoms predict response to methylphenidate in patients with attention-deficit/hyperactivity disorder-inattentive type?
Ludwig HT, Matte B, Katz B, et al.
In this naturalistic study, we assessed the effect of sluggish cognitive tempo (SCT) symptoms in the response to methylphenidate (MPH) in 88 children and adolescents with attention-deficit/hyperactivity disorder-Inattentive Type (ADHD-I) according to Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) criteria. SCT symptoms were assessed in these subjects by means of the Child Behavior Checklist (CBCL) scale. The response to MPH after 1 month of treatment was assessed by parental scores in the Swanson, Nolan, and Pelham Questionnaire-Version IV (SNAP-IV) scale. No significant differences were found between subjects with and without SCT symptoms in the response to MPH either assessing presence of SCT symptoms categorically (at least 1 symptom) or dimensionally ($p < 0.5$ for both analyses; effect size [ES] = 0.24). Our findings corroborate previous phenotypic data suggesting that SCT symptoms do not define a clinically relevant type of ADHD-I.

J Shanghai Jiaotong Univ Med Sci. 2009;29:789-93.
Functional improvement in children with attention deficit hyperactivity disorder after methylphenidate treatment.
Ma J, Jin XM, Zhang LS.
Objective: To explore the improvement of core symptoms and detailed function in children with attention deficit hyperactivity disorder (ADHD) after treatment with methylphenidate extended-release tablets, and analyse the relationship between core symptoms reduction and detailed function improvement.
Methods: One hundred and fifty-six children with confirmed ADHD were rated with Swanson, Nolan, and Pelham, Version IV (SNAP-IV) Scale before treatment, then methylphenidate extended-release tablets were orally administered 18 mg once daily for 1 month, and children were rated again by means of SNAP-IV Scale and detailed function improvement questionnaire. The core symptoms reduction and detailed function improvement were observed, and their relationship was analysed.
Results: The primary mean scores of each factor in SNAP-IV Scale decreased significantly after treatment with methylphenidate extended-release tablets ($P < 0.001$). The reduction rate of factor IOWA/I/O was the most significant (> 50%), followed by ADHD-H/Im and ADHD-In. The performance of school study, homework doing and social behavioral function was improved, and the detailed function was significantly improved. The reduction rate in ADHD-In factor was significantly correlated with improvement of school study and homework doing ($P < 0.01$). The reduction rate in ADHD-H/Im factor was significantly correlated with improvement of social behavioral function ($P < 0.05$).
Conclusion: Methylphenidate extended-release tablets play a role in both core symptoms reduction and detailed function improvement in children with ADHD, and core symptoms reduction is related to detailed function improvement to some degree. Methylphenidate extended-release tablets exert different effects on different detailed function.

J Child Adolesc Psychopharmacol. 2009;19:363-76.
Attention-deficit/hyperactivity disorder diagnosis, co-morbidities, treatment patterns, and quality of life in a pediatric population in central and eastern Europe and Asia.
Martenyi F, Treuer T, Gau SSF, et al.
Attention deficit/hyperactivity disorder (ADHD) is often poorly understood, and treatment practices are variable. This 12-month, prospective, observational study provides information about the diagnosis, co-morbidities, treatment patterns, and quality of life (QOL) of patients aged 6-17 years with ADHD symptoms from eastern Asia and central and eastern Europe. Here, we present baseline data for the 1068 enrolled and eligible patients in the study (median age 8 years, 82.2% male). Patients were grouped into two cohorts based on whether they were prescribed psycho- and/or pharmacotherapy (n = 794) or not (n = 274) at study entry. On average, patients receiving treatment were significantly older (9.1 vs. 8.4 years, p < 0.001), more severely ill (Clinical Global Impressions [CGI]-ADHD-S, 4.6 vs. 4.2, p < 0.001; Child Symptom Inventory-4 Parent Checklist (CSI-4) ADHD:C, 35.2 vs. 31.9, p < 0.001), and had significantly higher CSI-4 symptom severity scores relating to various co-morbidities than patients not receiving treatment. At study initiation, patient's health-related QOL was significantly impaired as measured on the Child Health and Illness Profile-Child Edition (CHIP-CE) rating scale, with significantly more impairment in the treated group of patients for the Comfort, Risks Avoidance, and Achievement domains. These results provide a description of ADHD and treatment practices in these regions and establish a baseline for gauging changes over time in the study sample.

Drug Saf. 2009;32:1089-96.
Mortality associated with attention-deficit hyperactivity disorder (ADHD) drug treatment: A retrospective cohort study of children, adolescents and young adults using the general practice research database.
McCarthy S, Cranswick N, Potts L, et al.
Background: Following reports of sudden death in patients taking medicationto treat attention-deficit hyperactivity disorder (ADHD), this study aimed to identify cases of death in patients prescribed stimulants and atomoxetine and to determine any association between these and sudden death.
Method: The UK General Practice Research Database (GPRD) was used to identify patients aged 2-21 years from 1 January 1993 to 30 June 2006 with a prescription for methylphenidate, dexamfetamine or atomoxetine. Patients were followed from the date of first prescription until whichever came first: date of death, transferred-out date, age >21 years or end of the study period.
Results: From a cohort of 18 637 patient-years, seven patients died. Cause of death was obtained for six of the patients. None were deemed to be cases of sudden death. Compared with a general population rate of sudden death in the literature, the worst-case scenario of one case of sudden death gave an incident rate ratio of 1.63 (95% CI 0.04, 9.71). Although it was not the primary outcome of the study, following reports of suicide in the cohort the standardized mortality ratio (SMR) of suicide was calculated. Due to differences in the definition of suicide used for children and adults, patients were categorized into two age groups: 11-14 years and 15-21 years. The SMR for suicide for patients aged 11-14 years was 161.91 (95% CI 19.61, 584.88). The SMR for suicide for patients aged 15-21 years was 1.84 (95% CI 0.05, 10.25).
Conclusion: This study demonstrated no increase in the risk of sudden death associated with stimulants or atomoxetine. However, an increased risk of suicide was seen. Although we cannot exclude that the medications maycontribute to the increased risk of suicide, there are other factors such as depression and antisocial behaviour that frequently co-exist with ADHD, which can also predispose to teenage suicide. Clinicians should identify patients at increased risk of cardiovascular evens and identify those patients at increased risk of suicide, particularly males with co-morbid conditions, and monitor them appropriately.

Can Fam Phys. 2009;55:895-98.
Taking the stress out of individualizing ADHD drug therapy.
McLeod M, Laubscher T, Regier L, et al.

BMC Health Serv Res. 2009;9.

Preferences for treatment of Attention-Deficit/Hyperactivity Disorder (ADHD): A discrete choice experiment.

Muhlbacher AC, Rudolph I, Lincke HJ, et al.

Background. While there is an increasing emphasis on patient empowerment and shared decision-making, subjective values for attributes associated with their treatment still need to be measured and considered. This contribution seeks to define properties of an ideal drug treatment of individuals concerned with Attention-Deficit/Hyperactivity Disorder (ADHD). Because of the lack of information on patient needs in the decision-makers assessment of health services, the individuals' preferences often play a subordinate role at present. Discrete Choice Experiments offer strategies for eliciting subjective values and making them accessible for physicians and other health care professionals.

Methods. The evidence comes from a Discrete Choice Experiments (DCE) performed in 2007. After reviewing the literature about preferences of ADHS we conducted a qualitative study with four focus groups consisting of five to eleven ADHS-patients each. In order to achieve content validity, we aimed at collecting all relevant factors for an ideal ADHS treatment. In a subsequent quantitative study phase (n = 219), data was collected in an online or paper-pencil self-completed questionnaire. It included sociodemographic data, health status and patients' preferences of therapy characteristics using direct measurement (23 items on a five-point Likert-scale) as well as a Discrete-Choice-Experiment (DCE, six factors in a fold-over design).

Results. Those concerned were capable of clearly defining success criteria and expectations. In the direct assessment and the DCE, respondents attached special significance to the improvement of their social situation and emotional state (relative importance 40%). Another essential factor was the desire for drugs with a long-lasting effect over the day (relative importance 18%). Other criteria, such as flexibility and discretion, were less important to the respondents (6% and 9%, respectively).

Conclusion. Results point out that ADHD patients and their family members have clear ideas of their needs. This is especially important against the backdrop of present discussions in the healthcare sector on the relevance of patient reported outcomes (PROs) and shared decision-making. The combination of the methods used in this study offer promising strategies to elicit subjective values and making them accessible for health care professionals in a manner that drives health choices.

J Am Acad Child Adolesc Psychiatry. 2009;48:1014-22.

Widespread Cortical Thinning Is a Robust Anatomical Marker for Attention-Deficit/Hyperactivity Disorder.

Narr KL, Woods RP, Lin J, et al.

Objective: This cross-sectional study sought to confirm the presence and regional profile of previously reported changes in laminar cortical thickness in children and adolescents with attention-deficit/hyperactivity disorder (ADHD) compared with typically developing control subjects.

Method: High-resolution magnetic resonance images were obtained from 22 (19 male and 3 female subjects; mean age 11.7 years) children and adolescents with ADHD and 22 age- and sex-matched control subjects (mean age 11.7 years). Brain tissue volumes were estimated for each subject. Cortical pattern matching methods were used to sample measures of laminar thickness at high spatial frequency across homologous regions of the cortex. Volume and thickness measures were compared across diagnostic groups with and without controlling for general intelligence. False discovery rate correction confirmed regional results.

Results: The subjects with ADHD exhibited significant reductions in overall brain volume, gray matter volume, and mean cortical thickness compared with the controls, whereas white matter volumes were significantly increased in ADHD. Highly significant cortical thinning (false discovery rate-corrected $p < .0006$) was observed over large areas of the frontal, temporal, parietal, and occipital association cortices and aspects of motor cortex but not within the primary sensory regions.

Conclusions: Cortical thickness reductions present a robust neuroanatomical marker for child and adolescent ADHD. Observations of widespread cortical thinning expand on earlier cross-sectional findings and provide further evidence to support that the neurobiological underpinnings of ADHD extend beyond prefrontal and subcortical circuits.

Pediatr Health. 2008;2:671-72.
The real need for early identification of children with attention problems.
Nemeroff R.

Neuropharmacology. 2009;57:731-33.
Carboxylesterase 1 gene polymorphism and methylphenidate response in ADHD.
Nemoda Z, Angyal N, Tarnok Z, et al.
Methylphenidate (MPH) is the most frequently prescribed drug in the treatment of attention deficit hyperactivity disorder (ADHD). Several pharmacogenetic studies suggested that catecholamine candidate genes influence individual MPH-responses, but these results are mostly contradictory. Genetic analyses of MPH metabolizing carboxylesterase 1 enzyme (CES1) have not been carried out, whereas, meta-analysis of CYP2D6 genetic variants has been already indicated significant pharmacogenetic differences in atomoxetine treatment. Here we present an association analysis of the CES1 Gly143Glu functional polymorphism in a Hungarian ADHD group (n = 173). The genotype frequencies were similar to that of the general population (5.8% vs 4.1% of Gly/Glu heterozygote). Pharmacogenetic analysis was conducted among 122 ADHD children treated with MPH. Neither the categorical analysis comparing 90 responders vs 32 non-responders, nor the dimensional analysis of Inattention and Hyperactivity-Impulsivity score reduction showed a significant main genotype effect. However, analyzing the daily dose, we observed an association with the rare 143Glu-variant: 5 patients in the responder group carrying the Glu-allele required lower doses of MPH for symptom reduction (0.410 (plus or minus) 0.127 vs 0.572 (plus or minus) 0.153 mg/kg, t(1,88) = 2.33, p = 0.022). This result warrants for further investigations of the CES1 gene in larger ADHD samples.

J Can Acad Child Adolesc Psychiatry. 2009;18:92-102.
A clinical overview of sleep and attention-deficit/hyperactivity disorder in children and adolescents.
Owens JA.
Introduction: The relationship between attention-deficit/hyperactivity disorder (ADHD) and sleep is a complex one which poses many challenges in clinical practice.
Methods: Studies of sleep disturbances in children with academic and behavioral problems have underscored the role that primary sleep disorders play in the clinical presentation of symptoms of inattention and behavioral dysregulation. In addition, recent research has shed further light on the prevalence, type, risk factors for, and impact of sleep disturbances in children with ADHD.
Results: The following discussion of the multi-level and bi-directional relationships among sleep, neurobehavioral functioning, and the clinical syndrome of ADHD synthesizes current knowledge about the interaction of sleep and attention/arousal in these children.
Conclusion: Guidelines are provided, outlining a clinical approach to evaluation and management of children with ADHD and sleep problems.

Am J Psychiatry. 2009;166:1286-94.
An fMRI study of the effects of psychostimulants on default-mode processing during stroop task performance in youths with ADHD.
Peterson BS, Potenza MN, Wang Z, et al.
Objective: The authors examined the effect of psychostimulants on brain activity in children and adolescents with ADHD performing the Stroop Color and Word Test.
Method: The authors acquired 52 functional MRI scans in 16 youths with ADHD who were known responders to stimulant medication and 20 healthy comparison youths. Participants with ADHD were scanned on and off medication in a counterbalanced design, and comparison subjects were scanned once without medication.
Results: Stimulant medication significantly improved suppression of default-mode activity in the ventral anterior cingulate cortex in the ADHD group. When off medication, youths with ADHD were unable to suppress default-mode activity to the same degree as comparison subjects, whereas when on medication, they suppressed this activity to comparison group levels. Greater activation of the lateral prefrontal cortex

when off medication predicted a greater reduction in ADHD symptoms when on medication. Granger causality analyses demonstrated that activity in the lateral prefrontal and ventral anterior cingulate cortices mutually influenced one another but that the influence of the ventral anterior cingulate cortex on the lateral prefrontal cortex was significantly reduced in youths with ADHD off medication relative to comparison subjects and increased significantly to normal levels when ADHD youths were on medication.
Conclusions: Psychostimulants in youths with ADHD improved suppression of default-mode activity in the ventral anterior cingulate and posterior cingulate cortices, components of a circuit in which activity has been shown to correlate with the degree of mind-wandering during attentional tasks. Stimulants seem to improve symptoms in youths with ADHD by normalizing activity within this circuit and improving its functional interactions with the lateral prefrontal cortex.

Biol Psychiatry. 2009;66:926-34.
Case-Control Study of Six Genes Asymmetrically Expressed in the Two Cerebral Hemispheres: Association of BAIAP2 with Attention-Deficit/Hyperactivity Disorder.
Ribases M, Bosch R, Hervas A, et al.
Background: Attention-deficit/hyperactivity disorder (ADHD) is a childhood-onset neuropsychiatric disease that persists into adulthood in at least 30% of patients. There is evidence suggesting that abnormal left-right brain asymmetries in ADHD patients may be involved in a variety of ADHD-related cognitive processes, including sustained attention, working memory, response inhibition and planning. Although mechanisms underlying cerebral lateralization are unknown, left-right cortical asymmetry has been associated with transcriptional asymmetry at embryonic stages and several genes differentially expressed between hemispheres have been identified.
Methods: We selected six functional candidate genes showing at least 1.9-fold differential expression between hemispheres (BAIAP2, DAPPER1, LMO4, NEUROD6, ATP2B3, and ID2) and performed a case-control association study in an initial Spanish sample of 587 ADHD patients (270 adults and 317 children) and 587 control subjects.
Results: The single- and multiple-marker analysis provided evidence for a contribution of BAIAP2 to adulthood ADHD (p = .0026 and p = .0016, respectively). We thus tested BAIAP2 for replication in two independent adult samples from Germany (639 ADHD patients and 612 control subjects) and Norway (417 ADHD cases and 469 control subjects). While no significant results were observed in the Norwegian sample, we replicated the initial association between BAIAP2 and adulthood ADHD in the German population (p=.0062).
Conclusions: Our results support the participation of BAIAP2 in the continuity of ADHD across life span, at least in some of the populations analyzed, and suggest that genetic factors potentially influencing abnormal cerebral lateralization may be involved in this disorder.

Optom Vis Sci. 2009;86:1169-77.
Academic behaviors in children with convergence insufficiency with and without parent-reported ADHD.
Rouse M, Borsting E, Mitchell GL, et al.
Purpose. To determine if children with symptomatic Convergence Insufficiency without the presence of parent-reported Attention Deficit Hyperactivity Disorder (ADHD) have higher scores on the academic behavior survey (ABS).
Methods. The ABS is a 6-item survey that evaluates parent concern about school performance and the parents' perceptions of the frequency of problem behaviors that their child may exhibit when reading or performing schoolwork (such as difficulty completing work, avoidance, and inattention). Each item is scored on an ordinal scale from 0 (Never) to 4 (Always) with a total score ranging from 0 to 24. The survey was administered to the parents of 212 children 9- to 17-year old (mean age 11.8 years.) with symptomatic convergence insufficiency before enrolling into the Convergence Insufficiency Treatment Trial and to 49 children with normal binocular vision (NBV) (mean age 12.5 years). The parents reported whether the child had ADHD, and this information was used to divide the symptomatic convergence insufficiency group into the convergence insufficiency with parent report of ADHD or convergence insufficiency with parent report of no ADHD groups.
Results. Sixteen percent of the convergence insufficiency group and 6% of the NBV group were classified as ADHD by parental report. An analysis of covariance showed that the total ABS score for the symptomatic convergence insufficiency with parent report of ADHD group (15.6) was significantly higher than the symptomatic convergence insufficiency with parent report of no ADHD group (11.7, p = 0.001) and the NBV

group (8.7, p < 0.0001). Children with convergence insufficiency with parent report of no ADHD scored significantly higher on the ABS than the NBV group (p = 0.036).
Conclusions. Children with symptomatic convergence insufficiency with parent report of no ADHD scored higher on the ABS, when compared to children with NBV. Children with parent report of ADHD or related learning problems may benefit from comprehensive vision evaluation to assess for the presence of convergence insufficiency.

Behav Sci Law. 2009;27:577-98.
The relationship between attention deficit hyperactivity disorder, conduct disorder, and psychopathy in adolescent male and female detainees.
Sevecke K, Kosson DS, Krischer MK.
Although ADHD and CD are apparent risk factors for adult psychopathy, there are three distinct perspectives regarding their relationships to psychopathy: (1) ADHD may contribute uniquely to the development of psychopathy or (2) its contribution may reflect its high comorbidity with CD. Alternatively, (3) the comorbid presence of ADHD and CD may confer unique risk for the development of psychopathy. Although prior adult studies have yielded conflicting findings, no prior studies of adolescents address this issue. We examined these three hypotheses and the possibility of sex differences using cross-sectional analyses in 90 male and 123 female incarcerated adolescents. Among males the influence of ADHD was largely attributable to the overlap between ADHD and CD, whereas among females ADHD contributed independently to psychopathy scores and to scores on several dimensions of psychopathy. In addition, among females, the ADHD null CD interaction was significant for the total score and the antisocial component of psychopathy and in a direction opposite to that predicted by the comorbid subtype hypothesis. These findings indicate that there may be sex-specific pathways to elevations in psychopathic traits and suggest that the comorbid subtype hypothesis is probably not correct for either boys or girls.

Exp Clin Psychopharmacol. 2009;17:291-301.
Effects of Methylphenidate on Discounting of Delayed Rewards in Attention Deficit/Hyperactivity Disorder.
Shiels K, Hawk J, Reynolds B, et al.
Impulsivity is a central component of attention deficit/hyperactivity disorder (ADHD). Delay discounting, or a preference for smaller, immediate rewards over larger, delayed rewards, is considered an important aspect of impulsivity, and delay-related impulsivity has been emphasized in etiological models of ADHD. In this study, we examined whether stimulant medication, an effective treatment for ADHD, reduced discounting of delayed experiential and hypothetical rewards among 49 children (ages 9-12 years) with ADHD. After a practice day, participants completed a 3-day double-blind placebo-controlled acute medication assessment. Active doses were long-acting methylphenidate (Concerta), with the nearest equivalents of 0.3 and 0.6 mg/kg TID immediate-release methylphenidate. On each testing day, participants completed experiential (real-world money in real time) and hypothetical discounting tasks. Relative to placebo, methylphenidate reduced discounting of delayed experiential rewards but not hypothetical rewards. Broadly consistent with etiological models that emphasize delay-related impulsivity among children with ADHD, these findings provide initial evidence that stimulant medication reduces delay discounting among those with the disorder. The results also draw attention to task parameters that may influence the sensitivity of various delay discounting measures to medication effects.

J Child Adolesc Psychopharmacol. 2009;19:341-50.
A randomized, double-blind, placebo-controlled study of atomoxetine in Japanese children and adolescents with attention-deficit/hyperactivity disorder.
Takahashi M, Takita Y, Yamazaki K, et al.
Objectives: Until the recent approval of methylphenidate (MPH), Japan had no approved treatment for attention-deficit/hyperactivity disorder (ADHD). The need still exists for an effective, safe, nonstimulant

treatment. This first placebo-controlled Japan study of an ADHD nonstimulant therapy assessed atomoxetine efficacy and safety to determine the optimal dose for controlling ADHD symptoms in children and adolescents.
Methods: A total of 245 Japanese children and adolescents, aged 6-17 years and diagnosed with ADHD, were randomly assigned to receive placebo or one of three atomoxetine doses (0.5, 1.2, and 1.8 mg/kg per day) over 8 weeks. Symptoms were assessed with the Japanese Attention-Deficit/Hyperactivity Disorder Rating Scale-IV-Parent Version: Investigator scored and integrated with teacher reports (ADHD RS-IV-J:I/Sch). Adverse events, vital signs, laboratory tests, and electrocardiograms (ECGs) were obtained for safety analysis.
Results: In all, 234 patients completed the study. Atomoxetine at 1.8 mg/kg per day was significantly superior to placebo in reducing ADHD symptoms (p = 0.01; one-sided). Decreased appetite and vomiting were significantly greater in the atomoxetine treatment groups; however, no clinically significant differences were observed. Two patients discontinued due to affect lability and headache. A linear dose-response and vital signs similar to those from other atomoxetine studies were observed.
Conclusion: Atomoxetine provides an effective and safe nonstimulant option for the treatment of Japanese pediatric patients with ADHD.

Indian J Med Res. 2009;130:44-50.
Changes in the cardiac autonomic regulation in children with attention deficit hyperactivity disorder (ADHD).
Tonhajzerova I, Ondrejka I, Adamik P, et al.
Background & objectives: ADHD is one of the most common mental disorders among children. We hypothesized that ADHD is associated with the impairment of the cardiac autonomic regulation. The aim of this study was to evaluate the cardiac autonomic regulation in children with ADHD at the rest and during orthostasis using short-term heart rate variability (HRV) analysis.
Methods: Eighteen children with ADHD admitted to the Department of Children and Adolescent Psychiatry, Clinic of Psychiatry, University Hospital in Martin, Slovak Republic between January and September 2006 and 18 matched healthy subjects were recruited. HRV analysis was carried out in three positions: supine (S1)-orthostasis (O)-supine (S2). Evaluated parameters were: the mean R-R interval, mean squared successive difference (MSSD), spectral powers in low (LF) and high frequency (HF) bands, total power (TP), coefficients of component variance (CCV LF, CCV HF), LF/HF ratio.
Results: The mean R-R interval was significantly shorter in ADHD group compared to controls in all positions ($P<0.05$, $P<0.001$). S1: The parameters MSSD, CCV HF, logHFpower were significantly lower ($P<0.05$, $P<0.05$, $P<0.01$) and ratio LF/HF was significantly higher ($P<0.05$) in ADHD group compared to controls. O: The parameters MSSD, CCVHF, logHFpower, logTP were significantly lower in ADHD group compared to controls ($P<0.01$, $P<0.05$, $P<0.01$, $P<0.01$). S2: The parameters MSSD and logHFpower were significantly lower in children with ADHD compared to controls ($P<0.05$).
Interpretation and conclusions: The children with ADHD had decreased cardiac vagal modulation and tachycardia in supine positions with altered ability of dynamic activation of the autonomic nervous system in response to orthostasis indicating changes in the cardiac autonomic regulation. Further studies need to be done on a larger sample to confirm these findings and to understand the underlying mechanisms

Rev Chil Pediatr. 2009;80:332-38.
Attention Deficit/Hyperactivity Disorder (ADHD) in School Age Children in Antofagasta.
Urzua M, Domic S, Cerda C, et al.
Objective: To evaluate the prevalence of Attention Deficit/Hyperactivity Disorder (ADHD) in the city of Antofagasta.
Patients and Methods: Teachers and parents of 640 children (290 boys and 350 girls) between 6 and 11 years, from public, subsidized and private schools were evaluated through the Attention Deficit Hyperactivity Disorder Rating Scale-IV [ADHD-RS IV].
Results: Utilizing the ADHD Scale independently, the prevalence ranged between 5% and 15% depending on the informant. This number decreased to 2% when the criteria were required both at home and school environments.

Conclusion: In our population the prevalence of ADHD is highest in boys 6 to 8 years of age, being the combined disorder the most common subtype found in this group.

J Am Acad Child Adolesc Psychiatry. 2009;48:1023-30.

Is Overactivity a Core Feature in ADHD? Familial and Receiver Operating Characteristic Curve Analysis of Mechanically Assessed Activity Level.

Wood AC, Asherson P, Rijsdijk F, et al.

Objective: Symptoms of overactivity form part of the DSM-IV criteria for the combined or hyperactive-impulsive subtypes of attention-deficit/hyperactivity disorder (ADHD); yet little data exist that would quantify the nature of the overactivity component. We aimed to quantify the ability of four different measures of motion sensor data, taken from actigraphs, and the intraindividual variability (IIV) in these measures, to distinguish ADHD cases from controls. Furthermore, we aimed to investigate the degree of shared familial influences on these measures and the ADHD diagnosis.

Method: Receiver operating characteristic analysis and multivariate structural equation modeling were used on actigraph data collected during a cognitive testing session in a sample of 116 ADHD combined-type probands, 119 of their siblings, and 218 control siblings (age range 6-18 years).

Results: Three measures of actigraph data-the number of movements made, the magnitude of these movements, and the IIV in the magnitude of movements-yielded an area under the curve of up to 0.8, indicating an ability to distinguish between cases and controls. The latter two of these measures showed significant shared familial vulnerability with an ADHD diagnosis, with high ADHD-actigraph familial correlations.

Conclusions: The actigraph data support the DSM-IV conceptualization of including overactivity as one of the core features within ADHD combined subtype. The magnitude of movements made, and the IIV of these movements, may be suitable candidates for future molecular genetic studies seeking to identify polymorphisms associated with the risk for ADHD. Further research should investigate if these findings generalize to a more naturalistic, homelike setting.

Autism. 2009;13:523-38.

Set-shifting in children with autism spectrum disorders: Reversal shifting deficits on the intradimensional/extradimensional Shift Test correlate with repetitive behaviors.

Yerys BE, Wallace GL, Harrison B, et al.

Research examining set-shifting has revealed significant difficulties for adults with autism spectrum disorders (ASDs). However, research with high-functioning children with ASDs has yielded mixed results. The current study tested 6- to 13-year-old high-functioning children with ASD and typically developing controls matched on age, gender, and IQ using the Intradimensional/Extradimensional (ID/ED) Shift Test from the Cambridge Neuropsychological Test Automated Battery. Children with ASDs completed as many ED shifts and reversal ED shifts as controls; however, they made significantly more errors than controls while completing the ED reversal shifts. Analyses on a subset of cases revealed a significant positive correlation between ED reversal errors and the number of repetitive behavior symptoms in the ASD group. These findings suggest that high-functioning children with ASDs require additional feedback to shift successfully. In addition, the relationship between set-shifting and non-social symptoms suggests its utility as a potentially informative intermediate phenotype in ASDs.

Hum Brain Mapp. 2009;30:3426-35.

The fMRI success rate of children and adolescents: Typical development, epilepsy, attention deficit/hyperactivity disorder, and autism spectrum disorders.

Yerys BE, Jankowski KF, Shook D, et al.

Functional magnetic resonance imaging (fMRI) in children is increasingly used in clinical application and in developmental research; however, little is known how pediatric patient and typically developing populations successfully complete studies. We examined pediatric success rates with epilepsy, attention

deficit/hyperactivity disorder (ADHD), autism spectrum disorders (ASD), and typically developing children (TYP). We also examined the affect of age, and, for ADHD populations, medication status on success rates. We defined a successful fMRI individual run when the data were interpretable and included in group statistics. For unsuccessful runs, datasets with excessive motion or floor task performance were categorized when possible. All clinical groups scanned less successfully than controls; medication status did not affect ADHD success (epilepsy, 80%; ADHD (off methylphenidate), 77%; ADHD (on methylphenidate), 81%; ASD, 70%; TYP, 87%). Ten to 18-year-old had a signifi-cantly greater scan success rate than 4- to 6-year-old; adolescents (13- to 18-year-old) demonstrated greater scan success rates than 7- to 9-year-old. Success rate for completing an entire battery of experimental runs (n = 2-6), varied between 50-59% for patient populations and 69% for TYP (79% when excluding 4- to 6-year-old). Success rate for completing one run from a battery was greater than 90% for all groups, except for ASD (81%). These data suggest 20-30% more children should be recruited in these patient groups, but only 10-20% for TYP for research studies. Studies with 4- to 6-year-olds may require 20-40% additional participants; studies with 10- to 18-year-olds may require 10-15% additional participants.

J Shanghai Jiaotong Univ Med Sci. 2009;29:794-97.

Analysis of family environment of children with attention deficit hyperactivity disorder in clinics.

Zhang LS, Jin XM, Zhang YW.

Objective: To investigate the characteristics of family environment in children with attention deficit hyperactivity disorder (ADHD) in clinics, and analyse the risk factors for ADHD.

Methods: Two thousand two hundred and ninety-six children with inattention, hyperactivity or unfavourable school performance were subjected to diagnosis with DSM-IV criteria in clinics. The characteristics of family environment were investigated by self-prepared questionnaires. The risk factors for ADHD were explored by univariate analysis and nonconditioned multivariate Logistic regression analysis.

Results: Seven hundred and twenty children were diagnosed with ADHD. There were significant differences in family environment between children with ADHD and those without ($P < 0.05$ or $P < 0.01$). The risk factors for ADHD included discord between parents, parental smoking and maternal depression during pregnancy and after delivery, while older age, female, paternal higher educational background were protective factors for ADHD.

Conclusion: Unfavourable family environment may be associated with the prevalence of ADHD, and special attention should be paid to the family environment in the treatment of ADHD.

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