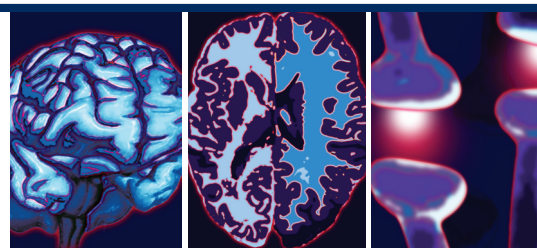


## NEWS

“The present findings highlight insights gained by examining early brain development among children with ADHD, and how findings among younger children may differ from those observed in older children.”



# Brain imaging study looks into the differences in children with ADHD

New findings, published in *The Clinical Neuropsychologist*, have begun to uncover some of the differences in brain activity and development in children with attention deficit hyperactivity disorder (ADHD). The preliminary study in question utilized MRI to view differences in brain structure in 26 preschool children (13 with ADHD and 13 normal controls), 4–5 years of age. The children selected were diagnosed using the standard DSM-IV criteria.

The results demonstrated that children with ADHD had a significantly smaller sized caudate nucleus. Typically, this region of the brain has been associated with threshold control and learning.

“When one considers how much of an impact ADHD can have upon a child’s normal development, it is clear that a greater understanding of the disorder is an important step in unraveling this complex problem.”

When speaking to *Neuropsychiatry* Mark Mahone, first author of the paper and a researcher at the Kennedy Krieger Institute (Baltimore, USA) said “By the age of 4 years, as many as 40% of children have sufficient problems with attention to be of concern to parents and preschool teachers, and ADHD has become the most commonly diagnosed form of psychopathology in the preschool years. Since ADHD is a disorder that by definition has its onset prior to age 7 years, it is critical to examine children prior to that age to better understand the neurobiological

course of the disorder. However, virtually all of the neuroimaging studies of children with ADHD have included only children of school age (i.e., age 6 years and older).”

Whilst other studies have looked at the metabolism of the caudate nucleus and ADHD, this study has focused on the structural component of the caudate nucleus. In addition to having a reduced volume, the researchers were also able to demonstrate that the size of the nucleus in these individuals correlated with parental ratings of hyperactivity and impulsive symptoms for their respective children.

“The findings from our study revealed early anomalies (reduced volumes) in the development of the caudate nucleus among preschool children presenting with symptoms of ADHD, and a strong association between bilateral caudate volumes and severity of hyperactive/impulsive (but not inattentive) symptoms.” explained Mahone.

When asked about the future impact of the work, Mahone replied “The present findings highlight insights gained by examining early brain development among children with ADHD, and how findings among younger children

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may differ from those observed in older children. We seek to make more targeted behavioral and pharmacological interventions earlier in children with ADHD, in order to improve developmental and functional outcomes in this group.”

Mahone stresses that these preliminary data are part of an ongoing study to further understand the link between development and ADHD, “These findings are part of a longitudinal study of preschool children with ADHD. We plan to follow 100 preschool children (50 at

risk for ADHD and 50 control subjects) in order to uncover a critical link between brain and behavioral development in ADHD, with the ultimate goal of identifying important early biomarkers for the disorder. In particular, this study should ultimately allow for the description and comparison of the early developmental changes in preschoolers that contribute to the behavioral phenotype, and ultimately the formal diagnosis of ADHD, as well as those factors (anatomy, cognition, behavior and environment) that are associated with ‘protection from’ the disorder”.

With ADHD being the most commonly diagnosed behavioral problem in children, it is important to continue research into the fundamentals of the disease. When one considers how much of an impact ADHD can have upon a child’s normal development, it is clear that a greater understanding of the disorder is an important step in unraveling this complex problem.

Source: Mahone EM, Crocetti D, Ranta ME *et al.* A preliminary neuroimaging study of preschool children with ADHD. *Clin. Neuropsychol.* 1, 1–20 (2011).

## New study looks into the prevalence of self-induced vomiting in adolescents for the purpose of weight loss

A new observational study looking at the prevalence of self-induced vomiting in adolescents aged 10–18 years, published in the *Journal of Clinical Nursing*, has revealed that almost 13% of the group induced vomiting to control their weight. The study looked at 120 schools with a total of over 16,000 students in Taiwan, demonstrating that the problem was affecting children as young as 10 years of age.

“Self-induced vomiting is an early sign that children could develop eating disorders and serious psychological problems, such as binge eating and anorexia.”

The study has revealed some surprising statistics about the incidence of this problem in school children, leading to the researchers warning that this form of behavior can lead to the development of

serious psychological disorders, including anorexia and binge eating. Speaking to *Neuropsychiatry*, Yiing Mei Liou, first author of the paper and Associate Professor at National Yang-Ming University (Taipei, Taiwan), commented on the importance of the work, “Self-induced vomiting is an early sign that children could develop eating disorders and serious psychological problems, such as binge eating and anorexia. Those who use self-induced vomiting have the associated features of sleeping less, a more sedentary behavior and skipping breakfast”.

The research, carried out on behalf of the Taiwan’s Ministry of Education, looked at 8673 girls and 7043 boys in 120 schools. The results also demonstrated that self-induced vomiting was more prevalent in younger children aged 10–12 years (who had a prevalence of 16%) and less so in 16–18 year olds (who had a prevalence of 8%). Males displayed a higher overall prevalence of 16% compared with females at 8%.

When considering what impact these results had, Liou explained “These results reinforce the need for public health campaigns that stress the negative impact that vomiting can have on their health and encourage them to tackle any weight issues in a healthy and responsible way.”

It is important to note that the researchers also found increased correlations between the act of self-induced vomiting and numerous other activities. These included ingestion of fried food, looking at a computer screen for more than 2 h a day and having less than 8 h sleep. Whilst observational studies lack evidence to provide causality, the data remain an important source of information when looking into the progression of eating disorders in children.

“These results reinforce the need for public health campaigns that stress the negative impact that vomiting can have on their health...”

When asked about the clinical importance of this study, Liou replied to *Neuropsychiatry* “Families, schools, and health professionals should attempt to identify and mitigate these behaviors as soon as possible. It may be possible to introduce strategies to prevent self induced vomiting, such as sleeping more than 8 hours and having breakfast every day.”

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Whilst the study looks only at the incidence of this disorder in Taiwanese schools, the risk and danger of this problem is evident in many schools throughout the developed world. Understanding and locating vulnerable groups can lead to a more targeted approach in dealing with these eating disorders, especially when one considers the young age of onset suggested from this research.

Source: Liou YM, Hsu YW, Ho JF, Lin CH, Hsu WY, Liou TH. Prevalence and correlates of self-induced vomiting as weight-control strategy among adolescents in Taiwan. *J. Clin. Nurs.* DOI: 10.1111/j.1365-2702.2011.03739.x (Epub ahead of print) (2011).

## Noninvasive direct current stimulation may help reduce impulsivity

A new study published in *Neuroimage* has looked into the effectiveness of mild brain stimulation on inhibitory control. In the investigation, led by Chi-Hung Juan of the Institute of Cognitive Neuroscience, National Central University in Taiwan (Taipei, Taiwan), the researchers looked at the effect of passing a weak electrical current

over the frontal scalps of participants on impulsivity control.

Numerous impulse control disorders exist, including attention deficit hyperactivity disorder (ADHD), which can result in difficulties in concentration, and Tourette's syndrome, a neuropsychiatric disorder that predominantly affects younger children with hallmark features of motor and vocal tics, which can be highly disruptive to normal life for the patient.

"The findings ... not only provide further understanding of the neural basis of inhibitory control but also suggest a possible therapeutic intervention method..."

The researchers applied noninvasive transcranial direct current stimulation over the presupplementary area of participants, demonstrating an improved inhibitory control for these participants.

Chi-Hung Juan commented, "The findings that electrical stimulation to the brain can improve control of their behavioral urges not only provide further understanding of the neural basis of inhibitory control but also suggest a possible therapeutic intervention method for clinical populations, such as those with drug additions or ADHD, in the future".

Although problems with impulse control can lead to various psychiatric and psychological problems, they all have a fundamental problem with inhibition. The new study suggests that more research needs to be performed to uncover the effectiveness of nonpharmacological treatments for these disorders.

Source: Hsu TY, Tseng LY, Yu JX. Modulating inhibitory control with direct current stimulation of the superior medial frontal cortex. *Neuroimage* 56(4), 2249–2257 (2011).

## Survey suggests that there is a link between depression during pregnancy and previous abuse

A paper published in *The Journal of Women's Health*, has examined the factors associated with pregnancy-related depression. Researchers from University of North Carolina at Chapel Hill School of Medicine (NC, USA) surveyed 158 women with concurrent pregnancy and depression and women with postpartum depression.

The survey utilized patients from University of North Carolina's Perinatal Psychiatry Clinic. Around one in ten women experience some form of pregnancy related depression, having profound effects upon the early relationship between mother and child. The results suggested that women who had a history of eating disorders, or sexual or physical abuse were more likely to have pregnancy-related depression.

Samantha Meltzer-Brody, lead author of the study and director at the University of North Carolina's Perinatal Psychiatry Program said "Screening by obstetrical providers is really important because they can refer patients for appropriate treatment, and that can prevent long-lasting problems for mom and baby".

Depression and eating disorders are often passed from parent to child, making it difficult to break a cycle of mental

health burden. Having a screening measure in place can enable healthcare providers to aid high-risk individuals, hopefully reducing the likelihood of these problems being passed on.

"The message we need to get out is that these things are incredibly common, and routine screenings need to occur. The prevalence of abuse and eating disorder histories may be much higher than people appreciate," said Meltzer-Brody.

Pregnancy is a particularly difficult time, due to the numerous hormonal and body changes, along with the major life-style and social changes that are associated with having a child. Thus, this period is a potentially high-risk time for depression in these mothers. However, Meltzer-Brody also believes that pregnancy could be a key time to intervene, "Pregnancy is a time when people are really motivated to make changes and get treatment, because that can have serious consequences for how you do and for how your children do".

Source: Meltzer-Brody S, Zerwas S, Leserman J, Holle AV, Regis T, Bulik C. Eating disorders and trauma history in women with perinatal depression. *J. Women's Health* 20(6), 863–870 (2011).