# CRIME Times

**Linking Brain Dysfunction to Disordered/Criminal/Psychopathic Behavior**

Volume 10, Number 2, 2004

## Brain damage seen in chronic gamblers

Compulsive gamblers show strong evidence of brain damage, according to a study by Marianne Regard and colleagues.

The researchers compared 21 pathological gamblers, none of them addicted to drugs, to 19 control subjects. "Because gamblers are not regarded as 'brain-lesioned' and gambling is nontoxic," Regard et al. say, "gambling is a model to test whether addicted 'healthy' people are relatively impaired in frontolimbic neuropsychological functions."

> The researchers conclude that "this study shows that the 'healthy' gamblers are indeed brain-damaged."

The researchers found that, compared to controls, gamblers were significantly more impaired in memory, concentration, and executive functions (skills associated with the frontal lobes, such as long-term planning, impulse control, and goal-directed behavior). Electroencephalograms showed abnormal activity in 65 percent of the gamblers, compared with only 26 percent of controls. In addition, a significantly higher proportion of gamblers were non-right-handed and exhibited

*continued on page 2*

## Do psychopaths' brains fail to understand the abstract?

Psychopaths are callous, glib, superficial, and impulsive; lack empathy for others; and display no guilt or remorse for their harmful acts. One reason for these traits, research suggests, is that psychopaths have difficulty understanding emotions. However, a new study indicates that psychopaths are impaired not just in the emotional realm, but more broadly, in understanding abstract information in general.

Kent Kiehl, Robert Hare, and colleagues studied eight male criminal psychopaths, all inmates of a maximum-security prison in Canada, comparing them to eight non-criminal, non-psychopathic controls. The researchers controlled for a wide range of factors including age, parental socioeconomic status, education level, and IQ.

The subjects participated in a test in which they viewed concrete words (such as "table"), abstract words (such as "justice"), and pseudo-words. All words were selected to be emotionally neutral to eliminate emotional response as a factor. Subjects viewed word groups containing either concrete words and similar-looking pseudo-words, or abstract words and similar-looking pseudo-words. They were instructed to raise one hand each time a real word appeared, and to raise the other hand if a pseudo-word appeared. During the tests, the researchers investigated brain changes in the participants using functional magnetic resonance imaging (fMRI).

Psychopathic subjects, Kiehl et al. say, "performed more poorly, manifested as slower reaction times, than control participants, when processing abstract word stimuli." This is consistent, they say, with studies showing that psychopaths have trouble processing abstract words, performing abstract categorization tasks, understanding metaphors, and processing emotionally weighted words and speech.

In particular, the psychopaths showed clear deficits in activating one brain area, the right anterior superior temporal gyrus, when processing abstract stimuli. This region failed to differentiate normally between abstract and concrete stimuli.

The researchers say, "These data support the hypothesis that there is an abnormality in the function of the right anterior superior temporal gyrus in psychopathy."

"Perhaps," the researchers say, "psychopathic individuals have difficulty engaging in cognitive functions that involve material that has no concrete realization in the external world. We might speculate that complex social emotions such as love, empathy, guilt and remorse may be a form of more abstract functioning. Thus, difficulties in processing and integrating these conceptually abstract representations to regulate or modulate behavior would be [seen] in these individuals."

—

"Temporal lobe abnormalities in semantic processing by criminal psychopaths as revealed by functional magnetic resonance imaging," Kent A. Kiehl, Andra M. Smith, Adrianna Mendrek, Bruce B. Forster, Robert D. Hare, and Peter F. Liddle, *Psychiatry Research: Neuroimaging*, Vol. 130, 2004, 27-42. Address: Kent A. Kiehl, kent.kiehl@yale.edu.

Editorial

## HOPE FOR THE "HOPELESS"

Society shies away from biological explanations for criminality and disordered behavior because people tend to believe that "biological" equals "hopeless." Yet nothing could be further from the truth.

In this issue of *Crime Times* alone, we present research showing that:

• Omega-3 fatty acid therapy can reduce hostility, as well as disruptive or oppositional behavior.

• Treatment with quetiapine, an antipsychotic drug, can decrease rage reactions, aggression, hostility, and impulsive behavior in antisocial individuals.

• Zinc supplements can dramatically reduce ADHD symptoms in many children.

Past issues of *Crime Times* also highlight research showing that good diets drastically reduce antisocial behavior in prison populations (Volume 8, Number 2, 2002), that nutritional supplements can decrease delinquent behaviors in at-risk children and dramatically improve learning-disabled students' academic performance and behavior (Volume 6, Numbers 2 and 3, 2000), and that an enhanced diet can markedly increase IQ scores (Volume 6, Number 1, 2000). Indeed, this is just a very small sampling of dozens of articles *Crime Times* has published, since its inception in 1995, showing that biological interventions can change the lives of troubled or criminal individuals for the better.

This is true even when dysfunctional behavior stems from genetic defects, because we are learning how to correct the problems caused by once-untreatable gene flaws. For example, researchers have identified some children whose aberrant and dangerous behavior appears to stem from an excess of heavy metals caused by a genetic glitch that impairs the body's ability to detoxify itself. By lowering these children's toxic levels of lead or other heavy metals, and correcting associated nutrient deficiencies, clinicians can often bring about dramatic improvement. This is being done successfully every day at the Pfeiffer Treatment Center in Illinois, where William Walsh and his colleagues have an astonishing success rate in treating troubled, delinquent, and even psychopathic children.

Biologically-oriented professionals are also making huge strides in *preventing* brain dysfunction. One of these experts is *Crime Times* Professional Advisory Board member Ann Streissguth, whose pioneering research played a huge role in revealing the link between pregnant women's drinking and the costs to their children in the form of brain damage, learning disabilities, disruptive behavior, criminality, and ruined lives

Translating this knowledge into action, Streissguth and colleague Ruth Little formed the Seattle Pregnancy and Health Program, a project combining public education and active intervention for at-risk pregnant women. As a result of their intervention, the program's organizers report, "Three-fourths of women who were drinking moderately to heavily were able to either stop or significantly reduce their alcohol intake after a brief intervention [and] 86 percent were judged by independent raters to have improved." Dr. Streissguth and her colleagues are now involved in another project, the Parent-Child Assistance Program, which helps drug- or alcohol-abusing mothers break their addictions, protecting their future children from the ravages of prenatal alcohol or drug exposure. The direct result of these efforts: fewer infants born with irreparable brain damage, and more babies who have the potential for a bright future.

Dr. Walsh, Dr. Streissguth, and others like them are helping to usher in a new era in which we identify and treat—or, even better, prevent—the brain dysfunctions that cause millions of people to become delinquents, criminals, or tragic failures. Walsh's center is currently salvaging the lives of hundreds of children who otherwise would have been written off as irredeemably "evil." Streissguth's interventions are directly responsible for hundreds of babies being born whole and healthy, rather than brain-damaged. And both are proving that greater knowledge about the biological causes of aberrant or criminal behavior will bring hope to millions of people we now consider "hopeless."

## Gamblers show signs of brain damage

**(continued from page 1)**

non-left-hemisphere language dominance, both possible signs of early brain damage. Eighty-one percent of the gamblers had a history of brain damage, generally due either to traumatic head injury or complications before or during birth.

The researchers conclude, "This study shows that the 'healthy' gamblers are indeed brain-damaged," and in particular implicates damage to the frontolimbic systems of the brain.

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"Brain damage and addictive behavior: a neuropsychological and electroencephalogram investigation with pathologic gamblers," M. Regard, D. Knoch, E. Gutling, and T. Landis, *Cognitive and Behavioral Neurology*, Vol. 16, No. 1, March 2003, 47-53. Address: Marianne Regard, Dept. of Neurology, University Hospital Zurich, CH-8090 Zurich, Switzerland.

## Researchers investigate effects of omega-3 fatty acids on hostility, ADHD symptoms

Omega-3 fatty acids are crucial to brain development and function, and nutrition experts believe that today's typical diet is deficient in these nutrients (see *Crime Times* Vol. 5, No. 1, 1999, pages 1, 2, and 6). Two new studies add to growing evidence that supplementing the diets of children or adults with omega-3 fatty acids can markedly improve their behavior.

In one recent investigation, conducted as part of a study on cardiac health, Carlos Iribarren et al. examined the relationship between omega-3 intake and hostility. (Chronic hostility is a powerful risk factor for coronary disease.) The study involved nearly 3,600 urban young adults, all participants in a long-term research project. Iribarren and colleagues controlled for a wide range of factors that could affect their data, including participants' age, sex, race, location, education, marital status, body mass, tobacco and alcohol use, and physical activity.

The researchers report that higher consumption of the omega-3 fatty acid docosahexaenoic acid (DHA), or of omega-3-rich fish in general, was related to significantly lower levels of hostility. "These results," they say, "suggest that high dietary intake of DHA and consumption of fish rich in omega-3 fatty acids may be related to lower likelihood of high hostility in young adulthood."

In related research, Laura Stevens and colleagues recently reported positive findings in a study of 50 children with ADHD. The researchers gave half of their subjects a combination of polyunsaturated fatty acids (PUFAs) including omega-3 fatty acids, and the other half a placebo (olive oil). The researchers detected no significant improvement in overall ADHD behaviors in the group receiving the PUFAs (a finding that contrasts with other studies showing beneficial effects), but they report that "PUFA supplementation led to a greater number of participants showing improvement in oppositional defiant behavior from a clinical to a nonclinical range compared with olive oil supplementation." Increased concentrations of the fatty acid EPA (eicosapentaenoic acid) in red blood cells were associated with a decrease in disruptive behavior as rated by parents, and higher levels of EPA and DHA were associated with a reduction in disruptive behavior as rated by teachers.

The researchers also found that higher levels of vitamin E correlated with a decrease in hyperactivity, attention problems, conduct problems, and oppositional/defiant disorder. "The results of this pilot study," they say, "suggest the need for further research with both omega-3 fatty acids and vitamin E in children with behavioral disorders."

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"Dietary intake of omega-3, omega-6 fatty acids and fish: relationship with hostility in young adults—the CARDIA study," C. Iribarren, J. H. Markovitz, D. R. Jacobs, Jr., P. J. Schreiner, M. Daviglus, and J. R. Hibbeln, *European Journal of Clinical Nutrition*, Vol. 58, No. 1, January 2004, 24-31. Address: Carlos Iribarren, Division of Research, Kaiser Permanente, Oakland, CA 94611, cgi@dor.kaiser.org.

—and—

"EFA supplementation in children with inattention, hyperactivity, and other disruptive behaviors," L. Stevens, W. Zhang, L. Peck, T. Kuczek, N. Grevstad, A. Mahon, S. S. Zentall, L. E. Arnold, and J. R. Burgess, *Lipids*, Vol. 38, No. 10, October 2003, 1007-21. Address: Laura Stevens, Dept. of Foods and Nutrition, Purdue University, W. Lafayette, Indiana 47907.

### A test for low omega-3 fatty acids in ADHD?

Strong evidence linking omega-3 fatty acid abnormalities to ADHD comes from a new study by Brian Ross et al., who analyzed exhaled ethane levels—a non-invasive measure of oxidative damage to omega-3 fatty acids—in 10 ADHD subjects and 12 controls.

Subjects with ADHD had significantly higher ethane levels than controls, the researchers say, with half of ADHD cases being above the normal upper limits.

The researchers speculate that children with the highest exhaled-ethane levels may respond best to treatment with omega-3 fatty acids. They also recommend that supplementation include an antioxidant such as vitamin E, ubiquinone, or alpha lipoic acid.

"Dietary supplementation with long chain polyunsaturated fatty acids, especially of the omega-3 class, has also been found to have positive effects in depression and borderline personality disorder," they note, "while lipid and/or antioxidant vitamin and mineral therapy has reduced delinquent and aggressive behavior, suggesting an important link between diet, including lipid intake, and certain types of psychopathology."

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"Increased levels of ethane, a non-invasive marker of omega-3 fatty acid oxidation, in breath of children with attention deficit hyperactivity disorder," Brian M. Ross, Ivor McKenzie, Iain Glen, and C. Peter W. Bennett, *Nutritional Neuroscience*, Vol. 6, No. 5, October 2003, 277-81. Address: brian@ness-foundation.org.uk.

## ADHD children at high risk for drug, alcohol abuse

Two different studies confirm that children with attention deficit hyperactivity disorder (ADHD) are at high risk of developing alcoholism or drug problems later in life.

The first study, by Monika Johann et al., evaluated 314 adult alcoholics (262 males and 52 females) and 220 non-alcoholic controls.

"Our results indicate that individuals with persisting ADHD symptoms in adulthood seem to be at high risk of developing an alcohol-use disorder," Johann says. "Moreover, there is evidence for a highly increased severity of alcohol dependence in subjects with ADHD."

The researchers performed a gene analysis to see if two gene variants implicated in ADHD and alcoholism could be responsible for the ADHD/alcoholism connection, but they found no evidence of a link. However, they say their findings indicate a distinct pattern in ADHD subjects with alcoholism. Compared to other alcoholics, adult alcoholics with ADHD drank a much higher amount of alcohol daily, became problem drinkers earlier in life, were more prone to suicidal thoughts, had a higher number of court appearances, had a higher rate of antisocial personality disorder, and had a stronger family history of alcoholism.

Commenting on the study, physician Ema Loncarek, a specialist in treating drug addiction, says, "Dr. Johann's findings of a phenotype are very close to what we see in drug addicts with ADHD, and what has been described before by other authors. We see on a regular basis that drug addicts with ADHD are difficult to handle. They start to abuse drugs earlier than other people, change earlier to 'hard' drugs, take longer to start treatment, and take longer to successfully finish therapy."

A separate study, by Brooke Molina and William Pelham, Jr., compared the drug use of 142 teens diagnosed in childhood with ADHD and 100 non-ADHD controls. The ADHD children were part of a study that followed their development from childhood.

The researchers found that childhood ADHD increased the risk for use and abuse of alcohol and heavy drugs, and increased the risk for early tobacco and drug use. Interestingly, Molina notes, "Childhood ADHD symptoms, particularly the inattention dimension of ADHD, predicted later substance use to a greater degree than childhood antisocial behaviors."

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"Comorbidity of alcohol dependence with attention-deficit hyperactivity disorder: differences in phenotype with increased severity of the substance disorder, but not in genotype (serotonin transporter and 5-hydroxytryptamine-2c receptor)," M. Johann, G. Bobbe, A. Putzhammer, and N. Wordaz, *Alcoholism: Clinical & Experimental Research*, Vol. 27, No. 10, October 2003, 1527-34. Address: M. Johann, Department of Psychiatry, University of Regensburg, Regensburg, Germany, monika.johann@bzk.uni-regensburg.de.

—and—

"Childhood predictors of adolescent substance use in a longitudinal study of children with ADHD," B. S. Molina and W. E. Pelham, Jr., *Journal of Abnormal Psychology*, Vol. 112, No. 3, August 2003, 497-507. Address: B. S. Molina, University of Pittsburgh School of Medicine, Pittsburgh, PA 15213, molinab@msx.upmc.edu.

—and—

"Adult alcoholism and attention-deficit hyperactivity disorder are connected," news release, *Alcoholism: Clinical & Experimental Research*, October 14, 2003.

—and—

"Severity of ADHD in children increases risk of drug use in adolescence," news release, American Psychological Association, August 17, 2003.

## Zinc supplement reduces symptoms of ADHD

Two decades of research indicate that low zinc levels play a role in hyperactivity—a finding supported by a new study revealing that zinc can be a beneficial treatment for many children with attention deficit hyperactivity disorder (ADHD).

Mustafa Bilici et al. randomly assigned 400 children with ADHD (328 boys and 72 girls) to take either a placebo or 150 mg per day of zinc sulfate for 12 weeks. The researchers evaluated the subjects using a clinical ADHD scale, an adaptation of the Conners Teacher Questionnaire, and a parent rating scale.

Bilici et al. report that subjects taking zinc "showed significant improvement in hyperactivity, impulsivity and socialization scores," although the treatment had no effect on attention deficits. Older children with higher body mass indexes, low zinc levels, and low levels of free fatty acids responded best to the intervention.

The researchers note that zinc is integral to the production of serotonin, and that low serotonin is linked to a wide range of behavior problems, including impulsivity. In addition, Bilici et al. note, zinc is needed for the production and modulation of melatonin, which helps regulate dopamine function, and ADHD is strongly linked to abnormal dopamine levels.

Zinc also is involved in the metabolism of essential fatty acids, which in turn help regulate dopamine and norepinephrine metabolism. Studies implicate low levels of essential fatty acids in ADHD (see p. 3), and Bilici et al. note that in their study, zinc treatment resulted in a rise in both zinc and free fatty acids.

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## Is "female" hormone a key factor in male aggression?

Research into the effects of hormones on male aggression typically focuses on testosterone and other "male" hormones, but a new study indicates that one form of estrogen—estradiol—also plays an important role.

While estradiol is thought of as a "female" hormone, it is also produced by males. To investigate estradiol's effects on male behavior, C. J. Peter Eriksson and colleagues recruited 40 men with a history of alcohol-related aggression, and 44 men without such a history. Participants filled out questionnaires detailing how often they handled conflict with a spouse or other partner by resorting to non-violent emotional negotiation (e.g., "showed respect for my partner's feelings about an issue"), non-violent cognitive negotiation (e.g., "suggested a compromise to a disagreement"), minor or severe psychological aggression, minor or severe physical assault, or minor or severe injury-causing aggression. The researchers measured each subject's hormone levels using morning plasma samples.

Eriksson et al. found that:

- Testosterone levels correlated positively with physical assault and injury in the men with alcohol-related aggression.
- Estradiol levels were positively associated, in both aggressive men and controls, with the use of emotional negotiation during conflicts.
- Estradiol, but not testosterone, was associated with psychological aggression in both aggressive men and controls.
- In men with alcohol-related aggression, there was a negative association between estradiol levels and testosterone-related physical, violent aggression.

The researchers say, "To the best of our knowledge, our study is the first to report that endogenous estradiol may in fact counteract testosterone-related physical aggression with inflicted injury." Their results, they say, "support the hypothesis that regulation of human violent behavior may involve the deliberate balance between male androgens and female estrogens."

Their results, Eriksson et al. say, "support the hypothesis that regulation of human violent behavior may involve the deliberate balance between male androgens and female estrogens."

Eriksson et al. also say the link between higher estradiol and empathy detected in their study, as shown by the increase in emotional negotiation, is interesting in light of recent research showing that expectant fathers have elevated levels of estradiol.

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"Oestradiol and human male alcohol-related aggression," C. J. Peter Eriksson, Bettina von der Pahlen, Taisto Sarkola, and Kaija Seppa, *Alcohol and Addiction*, Vol. 38, No. 6, 2003, 589-96. Address: C. J. Peter Eriksson, National Public Health Institute, Department of Mental Health and Alcohol Research, P.O. Box 33, FIN-00251 Helsinki, Finland, peter.eriksson@ktl.fi.

—see also—

"Study finds changes in hormone levels in men who become fathers," news release, Mayo Clinic, June 2001.

*Crime Times* is interested in hearing from readers conducting research pertaining to biological influences on criminality and psychopathology. Reprints of research papers are appreciated.

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## QUOTABLE

"The criminal justice system is most ineffective in identifying, prosecuting, punishing, deterring, or reforming criminals. If we had a radar defense system or an emergency medical system that operated at the level found in the criminal justice system, we would not be alive for very long.... The criminal justice system is reactive and not proactive; that is, it waits for the crime to occur before reacting, and it does not try to prevent crimes before they occur."

*—C. Ray Jeffery, Ph.D. in* Criminology–An Interdisciplinary Approach

## Hostile people prove easier prey for cigarette addiction

People who are hostile may be "born to smoke," according to a recent study.

James H. Fallon and colleagues gave 86 subjects personality exams, and divided them into two groups—hostile people characterized by anger, aggression, and anxiety; and low-hostility control subjects. Both groups included smokers and non-smokers.

The researchers then gave subjects either a placebo or a nicotine patch, using two different strengths of nicotine patch, and performed PET scans to see if the nicotine caused a response in subjects' brains.

Low-hostility subjects showed no metabolic changes, but in the high-hostility group, nicotine caused "dramatic metabolic changes" on both sides of the brain. Hostile non-smokers responded to both nicotine patches, while hostile smokers responded only to the higher-dose patch, probably because they were habituated to nicotine. Further analysis showed that the most significant changes occurred in the the most hostile subjects. Changes occurred when subjects performed a task measuring aggression, but not when they performed a sustained-attention task.

Says study co-author Steven Potkin, "Based on these dramatic brain responses to nicotine, if you have hostile, aggressive personality traits, in all likelihood you have a predisposition to cigarette addiction without ever having even touched a cigarette."

Says study co-author Steven Potkin, "Based on these dramatic brain responses to nicotine, if you have hostile, aggressive personality traits, in all likelihood you have a predisposition to cigarette addiction without ever having even touched a cigarette."

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"Hostility differentiates the brain metabolic effects of nicotine," J. H. Fallon, D. B. Keator, J. Mbogori, J. Turner, and S. G. Potkin, *Cognitive Brain Research*, Vol. 18, No. 2, January 2004, 142-8. Address: S. G. Potkin, Dept. of Anatomy and Neurobiology, UC Irvine, BIRN-RP, 5251 California, Suite 240, Irvine, CA 92697.

—and—

"Hostile people may be 'born to smoke': study," Reuters, February 13, 2004.

## Zinc therapy reduces ADHD symptoms (continued from page 4)

In light of their findings, the researchers say, "it can be suggested that there is a synergism of zinc and essential fatty acids in regulating dopamine, norepinephrine, and possibly serotonin activity, with implications for treatment of ADHD." Because zinc alone did not completely ameliorate all symptoms of ADHD, the researchers say, it may be most effective as an adjunct to other treatments.

Researcher Bernard Rimland, commenting on the study, says, "The improvement seen in these children in just 12 weeks is particularly remarkable given that hyperactive children who are deficient in zinc are likely to be deficient in other nutrients, such as magnesium, as well. Giving these children adequate supplements of all essential nutrients is likely to be vastly more beneficial than merely giving one nutrient, and should be tried in place of drug treatment."

Support for this approach comes from a study, conducted last year, in which K. L. Harding and colleagues placed 10 children with ADHD on Ritalin, and compared them to 10 ADHD children given dietary supplements consisting of vitamins, minerals, essential fatty acids, amino acids, and other nutrients. The researchers found that "the effect of Ritalin versus dietary supplement treatment was found to be essentially the same, and both treatments were found to be effective after four weeks of use."

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"Double-blind, placebo-controlled study of zinc sulfate in the treatment of attention deficit hyperactivity disorder," M. Bilici, F. Yildirim, S. Kandil, M. Bekaroglu, S. Yildirmis, O. Deger, M. Ulge, A. Yildiran, and H. Aksu, *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, Vol. 28, No. 1, January 2004, 181-90. Address: Mustafa Bilici, Department of Psychiatry, Medical Faculty, Karadeniz Technical University, School of Medicine, Trabzon, Turkey, bilici@msn.com.

—and—

"Outcome-based comparison of Ritalin versus food-supplement treated children with ADHD," K. L. Harding, R. D. Judah, and C. Gant, *Alternative Medicine Review*, Vol. 8, No. 3, August 2003, 319-30. Address: Charles Gant, National Integrated Health Associates, 5225 Wisconsin Avenue, Suite 401, Washington, DC 20015, drgantspractice@aol.com.

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## RESEARCH IN BRIEF

### Antipsychotic drug effective for antisocial behavior

A drug used to treat psychotic patients can also reduce behavior problems in antisocial individuals, according to a recent study.

C. Walker and colleagues administered the drug quetiapine (600 to 800 mg per day) to four patients with antisocial personality disorder. All of the subjects had been referred to a maximum-security inpatient psychiatric facility for pretrial evaluation.

"Quetiapine was effective in these patients," the researchers say, "as was indicated by a decrease in symptoms such as impulsivity, hostility, aggressiveness, irritability, and rage reactions."

—

"Treating impulsivity, irritability, and aggression of antisocial personality disorder with quetiapine," C. Walker, J. Thomas, and T. S. Allen, *International Journal of Offender Therapy and Comparative Criminology*, Vol. 47, No. 5, October 2003, 556-67. Address: C. Walker, Kentucky Correctional Psychiatric Center, 1612 Dawkins Road, LaGrange, KY 40031.

### EPA: One in six babies at risk for mercury toxicity

Researchers at the Environmental Protection Agency (EPA) have issued a new report saying that as many as one in every six pregnant women may have mercury levels high enough to disrupt fetal development.

Mercury is a powerful neurotoxin that can severely impair learning and behavior, particularly if children are exposed to elevated levels of this heavy metal before birth.

EPA studies have routinely measured mercury levels in pregnant women's blood as a means of determining the mercury exposure of their fetuses. However, EPA biochemist Kathryn Mahaffey now says, "We did not routinely measure [umbilical] cord blood. We had thought that the mother and the fetus had the same level."

New research, Mahafffey says, shows that mercury levels in fetal umbilical cord blood are actually 70 percent higher than levels in the mother's blood. As a result, even when mothers have blood mercury levels well below dangerous levels, their infants can suffer from mercury toxicity.

—

"Mercury threat to fetus raised: EPA revises risk estimates," Guy Gugliotta, *Washington Post*, February 6, 2004.

### Statins again linked to behavioral problems

Statin drugs, which lower cholesterol, may also cause extreme irritability in some individuals, according to a new study.

Beatrice Golomb et al. asked six patients who complained of irritability and short temper on statin drugs to complete a survey on the type and course of their symptoms.

"In each case," the researchers report, "the personality disruption, once evident, was sustained until statin use was discontinued, and resolved promptly with drug cessation." Four patients who resumed taking the drugs experienced a return of symptoms. "Manifestations of severe irritability included homicidal impulses, threats to others, road rage, generation of fear in family members, and damage to property," Golomb et al. say.

The findings are consistent with earlier research showing a link between low cholesterol and aggressive behavior (see *Crime Times* Volume 7, Number 3, 2001, page 7), possibly because low cholesterol levels can lead to reduced activity of the neurotransmitter serotonin. Reduced serotonin activity, in turn, can cause depression or violent behavior.

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Severe irritability associated with statin cholesterol-lowering drugs," B. A. Golomb, T. Kane, and J. E. Dimsdale, *QJM*, Volume 97, Number 4, April 2004, 229-35. Address: Beatrice Golomb, Department of Medicine, University of California, San Diego, California 92093.

### Does TV cause attention deficits?

Early television viewing is a risk factor for later attention problems, according to new research.

Dimitri Christakis et al. evaluated the records of children participating in a long-term, large-scale health study. By the age of seven, 10 percent of the children had been diagnosed as having attention disorders.

The researchers analyzed the television viewing habits of the children, controlling for environmental factors including cognitive stimulation and emotional support. They report that for every hour of television watched daily between the ages of one and three, the risk of developing attention problems increased by 9 percent. The researchers suggest limiting young children's exposure to television during the formative years of brain development.

—

"Early television exposure and subsequent attentional problems in children," Dimitri Christakis, Frederick Zimmerman, David DiGiuseppe, and Carolyn McCarty, *Pediatrics*, Vol. 113, No. 4, April 2004, 708-13. Address: Dimitri A. Christakis, Child Health Institute, University of Washington, Bldg. 29, 6200 NE 74th Street, Suite 210, Seattle, WA 98115.

—and—

"Study finds link between television viewing and attention problems in children," news release, Child Health Institute, April 5, 2004.

## *QUOTABLE*

"Psychiatrists are the only medical specialists who rarely look at the organ they treat. The odds are that if a patient is having serious problems with feelings (eg, depression), thoughts (eg, schizophrenia), or behavior (eg, violence), the psychiatrist will never order a brain scan. He or she will prescribe medication, psychotherapy, electroconvulsive therapy, or a host of other treatments that will change brain function—but will not know which areas of the patient's brain work well, which areas work too hard, and which do not work hard enough. In my opinion, the lack of brain imaging has kept psychiatry behind medicine's other specialties, reducing our effectiveness with patients and hindering our efforts to reduce stigma and improve compliance."

*—Daniel G. Amen, M.D., in*
"Why Don't Psychiatrists Look at the Brain? The Case for Greater Use of SPECT Imaging in Neuropsychiatry"


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