Violent video games and young people

Experts are divided about the potential harm, but agree on some steps parents can take to protect children.

Blood and gore. Intense violence. Strong sexual content. Use of drugs. These are just a few of the phrases that the Entertainment Software Rating Board (ESRB) uses to describe the content of several games in the *Grand Theft Auto* series, one of the most popular video game series among teenagers. The Pew Research Center reported in 2008 that 97% of youths ages 12 to 17 played some type of video game, and that two-thirds of them played action and adventure games that tend to contain violent content. (Other research suggests that boys are more likely to use violent video games, and play them more frequently, than girls.) A separate analysis found that more than half of all video games rated by the ESRB contained violence, including more than 90% of those rated as appropriate for children 10 years or older.

Given how common these games are, it is small wonder that mental health clinicians often find themselves fielding questions from parents who are worried about the impact of violent video games on their children.

The view endorsed by organizations such as the American Academy of Pediatrics (AAP) and the American Academy of Child & Adolescent Psychiatry (AACAP) is that exposure to violent media (including video games) can contribute to real-life violent behavior and harm children in other ways. But other researchers have questioned the validity or applicability of much of the research supporting this view. They argue that most youths are not affected by violent video games. What both sides of this debate agree on is that it is possible for parents to take steps that limit the possible negative effects of video games.

One view

In its most recent policy statement on media violence, which includes discussion of video games as well as television, movies, and music, the AAP cites studies that link exposure to violence in the media with aggression and violent behavior in youths. The AAP policy describes violent video games as one of many influences on behavior, noting that many children's television shows and movies also contain violent scenes. But the authors believe that video games are particularly harmful because they are interactive and encourage role-playing. As such, the authors fear that these games may serve as virtual rehearsals for actual violence.

Both the AAP and AACAP reason that children learn by observing, mimicking, and adopting behaviors—a basic principle of social learning theory. These organizations express concern that exposure to aggressive behavior or violence in video games and other media may, over time, desensitize

---

What's new

Improving Memory
Understanding age-related memory loss

Stroke
Preventing and treating "brain attack"

Special Health Reports from Harvard Medical School

To order, call 877-649-9457 (toll-free) or visit us online at www.health.harvard.edu.

Contact us

Write to us at
mental_letter@hms.harvard.edu

For customer service, write us at
harvardMH@strategicfulfillment.com

Visit us online at
www.health.harvard.edu/mental

KEY POINTS

- Much of the research on violent video game use relies on measures to assess aggression that don't correlate with real-world violence. Some studies are observational and don't prove cause and effect.

- Federal crime statistics suggest that serious violent crimes among youths have decreased since 1996, even as video game sales have soared.

- Parents can protect children from potential harm by limiting use of video games and taking other common-sense precautions.

Violent video games *continued*

youths by numbing them emotionally, cause nightmares and sleep problems, impair school performance, and lead to aggressive behavior and bullying.

A 2001 report of the U.S. Surgeon General on the topic of youth violence made a similar judgment. Some meta-analyses of the literature—reviewing psychological research studies and large observational studies—have found an association between violent video games and increased aggressive thinking and behavior in youths. And some casual observers go further, assuming that tragic school shootings prove a link between such games and real-world aggression.

A more nuanced view

In recent years, however, other researchers have challenged the popular view that violent video games are harmful. Several of them contributed papers to a special issue of the *Review of General Psychology,* published in June 2010 by the American Psychological Association.

In one paper, Dr. Christopher Ferguson, a psychology professor at Texas A&M International University, argued that many studies on the issue of media violence rely on measures to assess aggression that don't correlate with real-world violence—and even more important, many are observational approaches that don't prove cause and effect. He also cited data from federal criminal justice agencies showing that serious violent crimes among youths have decreased since 1996, even as video game sales have soared.

Other researchers have challenged the association between violent video game use and school shootings, noting that most of the young perpetrators had personality traits, such as anger, psychosis, and aggression, that were apparent before the shootings and predisposed them to violence. These factors make it more difficult to accept the playing of violent games as an independent risk factor. A comprehensive report of targeted school violence commissioned by the U.S. Secret Service and Department of Education concluded that more than half of attackers demonstrated interest in violent media, including books, movies, or video games. However, the report cautioned that no particular behavior, including interest in violence, could be used to produce a "profile" of a likely shooter.

The U.S. Department of Justice has funded research at the Center for Mental Health and Media at Massachusetts General Hospital to better determine what impact video games have on young people. Although it is still in the preliminary stages, this research and several other studies suggest that a subset of youths may become more aggressive after playing violent video games. However, in the vast majority of cases, use of violent video games may be part of normal development, especially in boys—and a legitimate source of fun too. Given the likelihood of individual variability, it may be useful to consider the impact of video games within three broad domains: personality, situation, and motivation.

Personality. Two psychologists, Dr. Patrick Markey of Villanova University and Dr. Charlotte Markey of Rutgers University, have presented evidence that some children may become more aggressive as a result of watching and playing violent video games, but that most are not affected. After reviewing the research, they concluded that the combination of three personality traits might be most likely to make an individual act and think aggressively after playing a violent video game. The three traits they identified were high neuroticism (prone to anger and depression, highly emotional, and easily upset), disagreeableness (cold, indifferent to other people), and low levels of conscientiousness (prone to acting without thinking, failing to deliver on promises, breaking rules).

Situation. Dr. Cheryl Olson, co-founder of the Massachusetts General Hospital Center for Mental Health and Media, led a study of 1,254 students in public schools (most were ages 12 to 14)

in South Carolina and Pennsylvania. The researchers found that certain situations increased exposure to violent video games—such as locating game consoles and computers in children's bedrooms, and allowing older siblings to share games with younger ones. In this study, children who played video games often with older siblings were twice as likely as other children to play mature-rated games (considered suitable for ages 17 and older).

Motivation. In a three-year study, a team led by Dr. Mizuko Ito, a cultural anthropologist at the University of California, Irvine, both interviewed and observed the online behavior of 800 youths. The researchers concluded that video game play and other online activities have become so ubiquitous among young people that they have altered how young people socialize and learn.
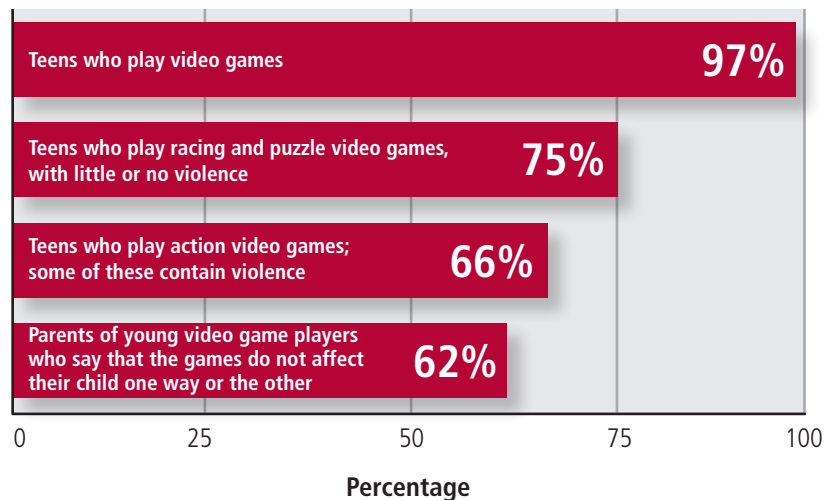
Although adults tend to view video games as isolating and antisocial, other studies found that most young respondents described the games as fun, exciting, something to counter boredom, and something to do with friends. For many youths, violent content is not the main draw. Boys in particular are motivated to play video games in order to compete and win. Seen in this context, use of violent video games may be similar to the type of rough-housing play that boys engage in as part of normal development. Video games offer one more outlet for the competition for status or to establish a pecking order.

What parents can do

Parents can protect their children from potential harm from video games by following a few commonsense strategies—particularly if they are concerned that their children might be vulnerable to the effects of violent content. These simple precautions may help:

- Check the ESRB rating to better understand what type of content a video game has.

Video game use among American teens

	Percentage
Teens who play video games	97%
Teens who play racing and puzzle video games, with little or no violence	75%
Teens who play action video games; some of these contain violence	66%
Parents of young video game players who say that the games do not affect their child one way or the other	62%

Source: PEW Internet & American Life Project, September 2008.

- Play video games with children to better understand the content, and how children react.

- Place video consoles and computers in common areas of the home, rather than in children's bedrooms.

- Set limits on the amount of time youths can play these games. The AAP recommends two hours or less of total screen time per day, including television, computers, and video games.

- Encourage participation in sports or school activities in which youths can interact with peers in person rather than online.

Video games share much in common with other pursuits that are enjoyable and rewarding, but may become hazardous in certain contexts. Parents can best protect their children by remaining engaged with them and providing limits and guidance as necessary. ▌

American Academy of Child & Adolescent Psychiatry. *Children and Video Games: Playing with Violence* (Facts for Families, updated Aug. 2006).

American Academy of Pediatrics. "Policy Statement—Media Violence," *Pediatrics* (Nov. 2009): Vol. 124, No. 5, pp. 1495–503.

Anderson CA, et al. "Violent Video Game Effects on Aggression, Empathy, and Prosocial Behavior in Eastern and Western Countries: A Meta-Analytic Review," *Psychological Bulletin* (March 2010): Vol. 136, No. 2, pp. 151–73.

Ferguson CJ. "Blazing Angels or Resident Evil? Can Violent Video Games Be a Force for Good?" *Review of General Psychology* (June 2010): Vol. 14, No. 2, pp. 68–81.

Ito M, et al. *Living and Learning with New Media: Summary of Findings from the Digital Youth Project* (The John D. and Catherine T. MacArthur Foundation, 2008).

Lenhart A, et al. *Teens, Video Games, and Civics* (Pew Internet & American Life Project, 2008).

Markey PM, et al. "Vulnerability to Violent Video Games: A Review and Integration of Personality Research," *Review of General Psychology* (June 2010): Vol. 14, No. 2, pp. 82–91.

Olson CK. "Children's Motivations for Video Game Play in the Context of Normal Development," *Review of General Psychology* (June 2010): Vol. 14, No. 2, pp. 180–87.

Olson CK, et al. "Factors Correlated with Violent Video Game Use by Adolescent Boys and Girls," *Journal of Adolescent Health* (July 2007): Vol. 41, No. 1, pp. 77–83.

For more references, please see www.health.harvard.edu/mentalextra.

Cognitive enhancement therapy for schizophrenia

Used early on, this hybrid therapy may improve mental and social functioning.

Difficulties in thinking and socializing, known as "negative" symptoms, often develop in patients with schizophrenia and typically persist even after hallucinations, delusions, and other "positive" symptoms of the disorder are under control. Various types of cognitive remediation therapies exist to improve mental and social functioning, but most have been studied only in patients with chronic schizophrenia.

In a study testing a cognitive intervention earlier in the schizophrenia disease process, researchers at the University of Pittsburgh published a series of papers about a randomized controlled trial evaluating a hybrid therapy, cognitive enhancement therapy, that combines cognitive remediation techniques with social skills training. The core study involved 58 young adult outpatients (the average age was 26) who were diagnosed either with schizophrenia or schizoaffective disorder. Patients had experienced their first psychotic symptom an average of three years prior to entry into the study; nearly 80% had been ill for fewer than five years. All had symptoms under control as the study began and continued taking their antipsychotic medications.

Repetitive skills training

Cognitive enhancement therapy is based on the premise that schizophrenia is a brain disorder that affects attention and verbal memory, and that these deficits contribute to disorganized thoughts and loss of social competence. This therapy involves a series of interactive drills and exercises, so that patients learn to improve aspects of cognitive function, such as appraisal of social context. Some of the techniques used during cognitive enhancement therapy were adapted from the treatment of traumatic brain injuries, and take advantage of the brain's remark-able plasticity—its ability to form new neural connections that can help people compensate for loss of brain function.

In the initial two-year trial, investigators randomly assigned 31 patients to cognitive enhancement therapy, consisting of weekly computer training in attention, memory, and problem solving, coupled with group therapy sessions designed to improve social skills and ability to function at home and in the community. Patients underwent a total of 60 hours of computer training and 45 hours of group therapy. The researchers assigned the other 27 participants to a control intervention, enriched supportive therapy, consisting of stress reduction techniques and coping skills to reduce risk of relapse.

In their first paper, the investigators reported that patients assigned to cognitive enhancement therapy improved significantly more than the other participants on composite assessments of cognitive style (such as rigid or disorganized thinking), social cognition (foresight or emotional processing), social adjustment (ability to function socially or work), and overall symptoms.

Initial and follow-up results

One year after the trial ended, the researchers reassessed participants to see whether benefits were maintained over time. They found that participants assigned to cognitive enhancement therapy remained significantly better in terms of overall social adjustment than those assigned to enriched supportive therapy. For example, they were more likely to have friends and participate in social activities.

In another paper—the first to examine the long-term brain effects of cognitive rehabilitation—the researchers reported results for the 53 participants who had undergone magnetic resonance imaging (MRI) scans, which were then used to estimate the amount of grey matter in specific areas of the brain. (Grey matter is largely made up of interconnected nerve cell bodies.) They found that patients assigned to cognitive enhancement therapy were more likely than those assigned to the control intervention to retain grey matter in brain regions associated with social and cognitive functioning.

Questions remain

The study had several limitations. While the imaging data are intriguing, for example, the investigators note that the absolute differences in grey matter between the two groups or among participants were small. In addition, other researchers have found that moderate exercise can increase gray matter in patients with schizophrenia, suggesting that brain volume change is not specific to any particular intervention. Finally, the investigators note that enriched supportive therapy also improved social functioning, albeit not as significantly as cognitive enhancement therapy.

Even with these caveats, however, these three reports add to the evidence that psychosocial treatment has value as an adjunct to medication, even early on in the schizophrenia disease course. Only time and additional study will reveal how much and for how long a combined approach reduces the disability caused by this disorder. ♥

Eack SM, et al. "Cognitive Enhancement Therapy for Early-Course Schizophrenia: Effects of a Two-Year Randomized Controlled Trial," *Psychiatric Services* (Nov. 2009): Vol. 60, No. 11, pp. 1468–76.

Eack SM, et al. "One-Year Durability of the Effects of Cognitive Enhancement Therapy on Functional Outcome in Early Schizophrenia," *Schizophrenia Research* (July 2010): Vol. 120, No. 1–3, pp. 210–16.

Eack SM, et al. "Neuroprotective Effects of Cognitive Enhancement Therapy Against Gray Matter Loss in Early Schizophrenia: Results from a 2-Year Randomized Controlled Trial," *Archives of General Psychiatry* (July 2010): Vol. 67, No. 7, pp. 674–82.

Managing dental phobia

It is best to combine several psychological strategies.

Surveys report that 13% to 24% of people are afraid of going to the dentist. In most cases, dental anxiety is unpleasant but does not interfere with health. People whose dental fear is severe, however, may so dread the thought of going to the dentist that they cancel appointments, delay seeking care, and sometimes wind up needing more invasive and painful procedures as a result—thereby meeting some of the criteria for specific phobia described in the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV).

In the *DSM-IV*, dental phobia is considered a type of specific phobia (the blood-injection-injury type). A large Dutch study using *DSM-IV* criteria to assess the prevalence of 11 specific phobias found that dental phobia was the most common (followed by phobias of heights and spiders). While it may be possible to avoid heights and spiders, dental problems such as toothaches or broken teeth necessitate a visit to the dentist.

Similar to findings about prevalence in other types of anxiety disorders, women are more likely than men to report experiencing dental fear and phobia. About half of adults who suffer from dental phobia can trace their fears back to unpleasant childhood experiences—memories that may be triggered at the sight of a dentist's chair, the sound of a dental drill, or the smell of antiseptic chemicals.

Although medications such as diazepam (Valium) and lorazepam (Ativan) may help reduce anxiety, they are best used in conjunction with various cognitive, educational, and behavioral strategies—especially those that help patients gain a sense of control in a situation where they may feel helpless. The following techniques are easy to learn, get better with practice, and can be combined during a dental visit.

Breathing techniques. Physical tension and emotional stress can increase the subjective experience of pain. People who are anxious tend to hold their breath or breathe rapidly. This sort of breathing pattern only heightens anxiety and muscle tension.

Deep breathing can counter physical and mental tension. One simple method to foster deep breathing is to breathe in slowly and count to five before exhaling to another count of five. Another technique is to place one hand beneath the belly button and breathe so that the abdomen rises and falls with each breath.

Muscle relaxation. Progressive muscle relaxation (tensing and then releasing one group of muscles at a time in order to promote whole-body relaxation) can help to slow heart rate and promote calmness. Just a few minutes of progressive muscle relaxation, focused on two or three major muscle groups, may help during an appointment.

Desensitization. This approach combines deep breathing and relaxation with gradual exposure (either through audiotapes, videotapes, or the patient's own imagination) to the cue that most triggers dental phobia. A patient afraid of needles, for example, may look at pictures of a dentist's needle in a safe environment such as at home or in a therapist's office, while practicing relaxation and breathing techniques. The goal is to help the patient learn to relax while confronting a trigger of dental fear.

Distraction. Putting the mind's focus elsewhere is another way to diminish the anxiety and pain of dental visits. The more complicated the task meant to distract, the better (listening to soothing music may not be enough). Children who are anxious may be distracted with stories or riddles. Adults can try counting (such as tiles on the ceiling, or slats on a window blind) as a way of turning attention away from the procedure itself. Another technique is to have the patient try to raise both legs at once whenever anxiety starts increasing, to provide a physical distraction.

Hypnosis. Hypnosis involves a state of deep relaxation attained through a combination of deep breathing, muscle relaxation, and attention modification. People who can't tolerate anesthesia and those who are afraid of needles may want to try hypnosis. It may be difficult to find a dentist trained in this technique, however. Because children tend to have more vivid imaginations than adults and are more open to suggestion, hypnosis may be a particularly good technique for pediatric patients. Some patients may also be able to hypnotize themselves by combining relaxation techniques with positive imagery or focus words.

Combined approach. Many patients with dental phobia may need a backup strategy in case the first one is not sufficient. The best relief may come from combining approaches and finding a dentist who is willing to incorporate them into the visit. ♥

Dionne RA, et al., eds. *Management of Pain and Anxiety in the Dental Office* (W.B. Saunders Company, 2002).

Loggia ML, et al. "Effects of Psychological State on Pain Perception in the Dental Environment," *Journal of the Canadian Dental Association* (Sept. 2008): Vol. 74, No. 7, pp. 651–56.

Oosterink FM, et al. "Prevalence of Dental Fear and Phobia Relative to Other Fear and Phobia Subtypes," *European Journal of Oral Science* (April 2009): Vol. 117, No. 2, pp. 135–43.

Peltier B. "Psychological Treatment of Fearful and Phobic Special Needs Patients," *Special Care Dentist* (Jan. 2009): Vol. 29, No. 1, pp. 51–57.

For more references, please see www.health.harvard.edu/mentalextra.

Second-step treatments for adolescent depression

The TORDIA study suggests options when initial drug treatment fails.

After six months of treatment with either an antidepressant or psychotherapy, about 60% of adolescents newly diagnosed with major depression attain remission. The Treatment of Resistant Depression in Adolescents (TORDIA) study was designed to determine how best to treat those youths who have not obtained adequate relief after one medication.

This government-funded randomized controlled trial enrolled 334 youths ages 12 to 18, newly diagnosed with major depression or dysthymia, who had not responded sufficiently to at least eight weeks of initial treatment with a selective serotonin reuptake inhibitor (SSRI). Participants were randomly assigned to one of four arms:

- another SSRI: citalopram (Celexa), fluoxetine (Prozac), or paroxetine (Paxil)
- the serotonin-norepinephrine reuptake inhibitor (SNRI) venlafaxine (Effexor)
- an SSRI combined with cognitive behavioral therapy (CBT)
- venlafaxine and CBT.

Factors predicting remission

At the 12-week mark, about half of the youths responded to treatment (defined as much or very much improved on the Clinical Global Impressions–Improvement score, and a decrease of at least 50% on the Children's Depression Rating Scale–Revised). Drug therapy combined with CBT proved most effective, with nearly 55% of participants responding. All of the antidepressants proved equally effective.

During the second phase of the TORDIA trial, participants who were responding to their assigned treatment continued taking it for another 12 weeks, while those who were not responding could choose which treatment they wanted to try for that period. The investigators defined remission as at least three consecutive weeks without clinically significant symptoms of depression. Roughly 40% of participants achieved remission by six months (see box). Remission rates were about the same regardless of assigned treatment.

One important predictor of reaching remission was early response. Participants who were responding to treatment by the 12-week mark were three times more likely to attain remission at six months than those who were not responding early on.

The study had key limitations. The second phase of the study was not completely randomized, as about half of participants were free to choose what type of treatment they wanted. In addition, the study did not include a placebo control, so that the investigators were unable to determine how youths might have fared if the depression had run its natural course.

Insights and questions

In an editorial accompanying the study, Dr. John T. Walkup, a professor of psychiatry at Weill Cornell Medical College, says that the TORDIA findings add to evidence produced by two earlier studies: the Treatment for Adolescents with Depression Study (TADS) and the Adolescent Depression Antidepressant and Psychotherapy Trial (ADAPT), which also tracked long-term outcomes.

All three studies found that combining CBT with medication did not improve long-term remission rates over drug therapy alone. In his editorial, Dr. Walkup suggests that the problem may not be CBT so much as the way it is applied in real-world clinical practice, or the way that research instruments measure results from studies. He notes that, in particular, research instruments used to rate depression outcomes focus on mood symptoms, and may therefore miss other aspects of recovery achieved through CBT.

Because early response predicted remission, the TORDIA study also raises questions about how aggressively to treat major depression in youths. This is an issue that deserves further study. ❤

Brent D, et al. "Switching to Another SSRI or to Venlafaxine with or without Cognitive Behavioral Therapy for Adolescents with SSRI-Resistant Depression: The TORDIA Randomized Controlled Trial," *Journal of the American Medical Association* (Feb. 27, 2008): Vol. 299, No. 8, pp. 901–13.

Emslie GJ, et al. "Treatment of Resistant Depression in Adolescents (TORDIA): Week 24 Outcomes," *American Journal of Psychiatry* (July 2010): Vol. 167, No. 7, pp. 782–91.

Walkup JT. "Treatment of Depressed Adolescents," *American Journal of Psychiatry* (July 2010): Vol. 167, No. 7, pp. 734–37.

For more references, please see www.health.harvard.edu/mentalextra.

TORDIA results at six months

Study arm	Remission rates	Time to remission
Medication alone (citalopram, fluoxetine, paroxetine, and venlafaxine all proved equally effective)	41% (69 of 168 participants)	13 weeks
Medication combined with cognitive behavioral therapy	37% (61 of 166 participants)	12 weeks

Source: Emslie GJ, et al. "Treatment of Resistant Depression in Adolescents (TORDIA): Week 24 Outcomes," *American Journal of Psychiatry* (July 2010).

Advice about living with bipolar disorder

In a memoir about living with bipolar disorder, Dr. Kay Redfield Jamison, a professor of psychiatry at Johns Hopkins University School of Medicine, wrote: "We all build internal sea walls to keep at bay the sadnesses of life and the often overwhelming forces within our minds." Her observation highlights a common challenge faced by people with bipolar disorder: learning how to manage fluctuating symptoms throughout life.

A recent study provides some practical advice on how to meet this challenge. Researchers at the University of British Columbia and colleagues recruited participants with bipolar disorder through advertisements. During initial phone interviews, the researchers used standard clinical instruments to confirm the diagnosis of bipolar disorder and assess general ability to function (such as working and living independently). The investigators then conducted 60- to 90-minute structured interviews with a final sample of 32 participants classified as high functioning. The participants identified a number of core strategies they used to avoid relapse and remain well:

- learning about bipolar disorder and educating loved ones, to combat stigma
- getting sufficient sleep and rest
- eating and exercising regularly
- monitoring moods to be alert to early signs of relapse
- adhering to medications, and increasing dose as necessary
- practicing yoga, tai chi, or other types of relaxing and meditative practices
- connecting with others socially
- having a care plan in place in advance, or relying on a loved one or friend to intervene, when relapse seems imminent.

The investigators found that many participants said they kept trying different combinations of these specific strategies, and learned what helped through trial and error.

Murray G, et al. "Self-Management Strategies Used by 'High Functioning' Individuals with Bipolar Disorder: From Research to Clinical Practice," *Clinical Psychology and Psychotherapy* (June 21, 2010): Electronic publication ahead of print.

Suto M, et al. "What Works for People with Bipolar Disorder? Tips from the Experts," *Journal of Affective Disorders* (July 2010): Vol. 124, No. 1–2, pp. 76–84.

Why eating slowly helps make people feel full

Many diet books advise people to chew slowly, so that they will feel full after eating less food than if they ate quickly. Eating slowly doesn't always work, but when it does, the reason has as much to do with the brain as with the gut.

Scientists have known for some time that a full stomach is only part of what causes someone to feel satisfied after a meal; the brain must also receive a series of signals from digestive hormones secreted by the gastrointestinal tract.

Stretch receptors in the stomach are activated as it fills with food or water; these signal the brain directly through the vagus nerve that connects gut and brainstem. Hormonal signals are released as partially digested food enters the small intestine. One example is cholecystokinin (CCK), released by the intestines in response to food consumed during a meal. Another hormone, leptin, produced by fat cells, is an adiposity signal that communicates with the brain about long-range needs and satiety, based on the body's energy stores. Recent research suggests that leptin amplifies the CCK signals, to enhance the feeling of fullness. Other research suggests that leptin also interacts with the neurotransmitter dopamine in the brain to produce a feeling of pleasure after eating. The theory is that, by eating too quickly, people may not give this intricate hormonal cross-talk system enough time to work.

Of course, as anyone who has tried eating slowly in order to lose weight can attest, it's not quite that simple. People who are obese, for example, may suffer from leptin resistance, meaning that they are less responsive to satiety or pleasure signals from this hormone. People are also sensitive to cues in the environment—such as the alluring smell of chocolate chip cookies or the sight of a juicy burger—that can trigger the desire to eat.

Appetite is complex, and dieting is a challenge. Even so, people who are trying to lose weight may want to start by chewing more slowly. In that way, they allow themselves enough time to experience pleasure and satiety.

THE **QUIRKY** BRAIN

Blevins JE, et al. "Hypothalamic-Brainstem Circuits Controlling Eating," *Forum of Nutrition* (2010): Vol. 63, pp. 133–40.

Leinninger GM, et al. "Leptin Acts via Leptin Receptor-Expressing Lateral Hypothalamic Neurons to Modulate the Mesolimbic Dopamine System and Suppress Feeding," *Cell Metabolism* (Aug. 2009): Vol. 10, No. 2, pp. 89–98.

Do anti-depressants cause cataracts?

Q Is it true that some antidepressants might cause cataracts?

A One recently published, large observational study in Canada—the first of its type—suggested that patients using selective serotonin reuptake inhibitors (SSRIs) or serotonin-norepinephrine reuptake inhibitors (SNRIs) were more at risk of developing cataracts than people who were not taking these drugs. It may be helpful to keep in mind that this was just one study using retrospective data, and it does not prove cause and effect. For several reasons, I'm advising my patients to continue getting the eye exams their ophthalmologists recommend, but not to get too alarmed by this study's results.

First of all, cataracts are common, developing in about half of all people ages 65 to 74, and in about 70% of those 75 and older. As people age, the normally clear lens in the eye becomes cloudy, thicker, and less resilient. Eye injuries, family history, and health problems such as diabetes can also increase risk of cataracts. Certain medications—among them the older antidepressants, particularly amitriptyline (Elavil)—may contribute to cataracts.

Animal studies have revealed not only that the lens contains receptors for serotonin, but also that elevated levels may promote cataract formation. Norepinephrine, which acts on beta receptors in the lens, may also contribute to cataracts. Researchers at the Vancouver Coastal Health Research Institute in Canada therefore decided to use a case-control study to investigate whether antidepressants that affect these neurotransmitters might increase risk of cataracts in people.

They used a national database of health records to construct the study cohort, which consisted of Quebec residents 65 and older with heart disease who had undergone a coronary revascularization procedure (such as insertion of a stent into a narrowed artery). Within this cohort, the researchers identified a sample of 18,784 patients diagnosed with cataracts by an ophthalmologist (the "cases"), and a larger group of 187,840 people without cataracts, who served as controls.

The investigators found that people currently taking an SSRI or SNRI were 15% more likely to develop cataracts than controls. According to the researchers' calculations, in absolute terms, this would translate into 22,000 extra cases of cataracts per year in the United States. People used SSRIs an average of nearly two years before being diagnosed with cataracts. (Past use of one of these drugs was not associated with cataract risk in this study.)

When the investigators examined the individual impact of six antidepressants, however, they found that two (and possibly three) significantly increased risk of cataracts. The SSRI fluvoxamine (Luvox) increased risk by 39%, while the SNRI venlafaxine (Effexor) raised risk by 33%. In a separate analysis of patients who received outpatient cataract surgery, paroxetine (Paxil) increased risk by 23%.

The study had limitations. Probably the most important was that the investigators drew on a sample of people—those treated for heart disease—who differ from the general population. Although the researchers adjusted for blood pressure and use of other medications, they did not adjust for other factors, such as cigarette smoking, that can increase risk of cataracts.

One study should not change recommendations about antidepressants or eye care. For many, the benefits of remaining on an antidepressant outweigh the risk of cataracts. For those who are getting key symptom relief or an enhanced quality of life from their medication, it may be worth bearing that risk, since good treatment for cataracts is available.

The American Academy of Ophthalmology recommends eye exams every two to four years for people ages 40 to 64, and every one to two years for people ages 65 and older. People with diabetes or other risk factors for cataracts may want to undergo such exams annually.

Send us a question

By mail Dr. Michael C. Miller
Harvard Mental Health Letter
10 Shattuck St., 2nd Floor
Boston, MA 02115

By e-mail mental_letter@hms.harvard.edu
(Please write "Ask the doctor" in the subject line.)

Because of the volume of correspondence we receive, we can't answer every letter or message, nor can we provide personal medical advice.