

## symposium

SYMPOSIUM ON ADDICTION

# Pathologic gambling disorder

How to help patients curb risky behavior when the future is at stake

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### *CME learning objectives*

- To be able to recognize pathologic gambling disorder
- To understand pathologic gambling disorder as a brain disease with specific neurobiologic findings
- To become familiar with the biopsychosocial treatments available for pathologic gambling disorder

*The authors disclose no financial interests in this article.*

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**Preview:** Pathologic gambling disorder and problem gambling are becoming increasingly common in the United States as more states legalize gambling. Although gambling-related disorders can cause devastating consequences, well-studied treatments are few. Fortunately, clinical experience suggests that pathologic gambling disorder is highly treatable. In this article, Drs Sumitra and Miller briefly summarize gambling-related disorders and discuss available, effective treatments.

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As gambling-related disorders proliferate in the United States, more people could benefit from effective treatments. Unfortunately, shame often keeps persons with gambling problems from seeking help. In addition, adequate study of treatment of gambling-related disorders is lacking. Until conclusive research on the pathologic factors of gambling is completed and effective treatments are identified, physicians need to rely on clinical experience, which suggests that pathologic gambling disorder is highly treatable (overall benefit-cost ratio, 20:1) (1).

## History and epidemiologic factors

Since about 3000 BC, gambling has been a significant part of human culture. It has found a place in religion, government, academia, literature, and psychology. The last two decades have seen a worldwide trend towards legalized gambling as a means for local governments to cheaply and reliably raise revenues to meet increasing governmental responsibilities and expenditures. Gambling-related disorders have followed suit, and the prevalence of pathologic gambling disorder in US adults is now estimated at 1% to 2% (2,3). However, the prevalence is twice that in areas in which a casino is within a 50-mile radius (4).

Pathologic gambling disorder is a chronic disease with an insidious onset and episodic course. It often begins in early adolescence in males and between ages 20 and 40 years in females. Exacerbations peak during periods of high stress and dysphoric mood. Persons with pathologic gambling disorder often delay seeking treatment because they are ashamed of their problem and struggle to keep it a secret while they attempt to recoup financial losses.

## Diagnosis and comorbid disorders

Pathologic gambling disorder is defined in the revised fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR)* as an impulse-control disorder; however, it can be better viewed as an addiction disorder. The mnemonic WAGER OFTEN (see box at the end of this article), created from the *DSM-IV-TR* criteria for pathologic gambling disorder, offers a guide to screening for this disease during brief office visits. Each *DSM-IV-TR* criterion is denoted in the mnemonic by its respective criterion number. Five or more criteria are required for diagnosis.

Differential diagnostic considerations include social gambling, problem gambling, manic or hypomanic episodes, obsessive-compulsive disorder and, rarely, professional gambling. Differentiation of gambling behaviors can be simplified by plotting several core issues along a continuum ([table 1](#)).

Problem gambling (not listed as a diagnosis in the *DSM-IV-TR*) represents social gambling that has begun to exceed limits and cross boundaries, thereby causing problems in the gambler's life. Problem gambling can be associated with increased frequency and

rising amounts of betting, continued gambling despite negative outcomes, and a progression to higher risk taking when gambling. However, persons with problem gambling do not meet the full criteria for pathologic gambling disorder.

As the illness progresses from problem gambling to pathologic gambling disorder, magical thinking often develops. Such thinking consists of attributing winning to personal skill while attributing losing to bad luck. Gamblers sometimes begin to plan activities and vacations around gambling events. Pathologic gambling disorder may progress in four phases: winning, losing, desperation, and giving up. Two widely used office screening instruments are the South Oaks Gambling Screen (5) and the Gamblers Anonymous 20 Questions (6).

Certain populations need special consideration. Female gamblers are more likely than male gamblers to live with someone who gambles or drinks, but they are less likely to have alcohol or legal problems themselves (7). Women usually gravitate towards games that require less strategy (eg, slots) and tend to gamble to escape thinking about life problems. Women are also more likely than men to seek mental health treatment (8). With the recent increase in legalized gambling, gambling disorders are probably more prevalent in adolescents than in the general population (4).

Common comorbid conditions include substance abuse and mood and anxiety disorders. Alcohol abuse and drug abuse are often associated with pathologic gambling disorder; estimates of prevalence range from 8% to 47% (9). Alcohol is often served free of charge in casinos (perhaps to lessen the inhibitions of gamblers), a practice that raises the risk of alcohol use disorders. Gamblers are often nicotine-dependent; smoking is associated with increased severity of gambling problems and psychiatric symptoms (10).

Depression is particularly common in female gamblers. Suicide is often contemplated (especially in the losing, desperation, and giving-up phases) and is attempted in a striking 15% to 20% of patients with pathologic gambling disorder (11). Personality disorders, especially antisocial personality disorder, have been linked with gambling. Recent studies have also suggested a relationship to other impulse-control disorders, such as compulsive sexual behavior and compulsive shopping. Clearly, depression and alcohol use problems are common, destructive conditions in patients with gambling disorders.

## **Types of gambling**

General categories of gambling include card games, lotteries, sports games, bingo, keno, slots, and pull tabs. Pull tabs are paper tickets featuring perforated windows that, when pulled back, reveal game symbols or numbers. State government-sponsored, they sell for about 50 cents to a dollar each; winning pull tabs award about \$50 to \$200 (odds ratio, about 1:6).

In the past decade, Internet gambling has emerged as the most accessible and immediately rewarding form of gambling. Unfortunately, Internet gambling often lacks consumer protections. Some experts suggest that Internet gambling is more addictive than

other forms of gambling. However, in general, any game of chance involving risk taking and reward (especially near-immediate reward) can be addictive. Even day-trading on the stock market can be considered a form of gambling.

## **Genetic and neurobiologic factors**

Addiction has been defined as a medical disease of the brain, and only recently has research probed the brain for clues to understanding pathologic gambling disorder. Four brain circuits involved in the progression of addiction may be implicated in pathologic gambling disorder: (1) reward (located in the nucleus accumbens and the ventral pallidum), (2) motivation and drive (located in the orbitofrontal cortex and subcallosal cortex), (3) memory and learning (located in the amygdala and the hippocampus), and (4) control (located in the prefrontal cortex and the anterior cingulate gyrus).

At the center of the reward circuit is the nucleus accumbens, also known as the *pleasure center* of the brain. Existing to ensure reinforcement of behaviors associated with species survival—hydration (thirst), nutrition (satiety), and species procreation (sex and orgasm)—it can be manipulated by various exogenous substances (eg, alcohol, cocaine, nicotine, opiates), resulting in an altered state manifested as a substance use disorder. This circuit has also been implicated in pathologic gambling disorder.

Impairment in the motivation and drive circuit has been identified in pathologic gambling disorder. The orbitofrontal cortex is normally activated when there is insufficient data to make an appropriate decision or when appropriate action requires suppression of previously rewarded responses. This circuit is important in decision making, including consideration of future consequences of behaviors and processing of rewards during the expectation and experiencing of monetary gains or losses (12). Neuropsychologic testing in male patients with pathologic gambling disorder has revealed impaired frontal cortex functioning.

Serotonin dysfunction has been implicated in a number of disorders of impulse control. Pathologic gambling disorder shares some features of serotonin dysregulation. Male patients with pathologic gambling disorder have been found to have abnormally low levels of 5-hydroxyindoleacetic acid (5-HIAA) and low peripheral levels of monoamine oxidase activity, both of which signify reduced serotonin function. These patients also have abnormal responses to challenges with serotonergic ligands and tend to report a "high" in response to metachlorophenylpiperazine (a drug with high affinity for 5-hydroxytryptamine receptor subtypes 5-HT<sub>1A</sub>, 5-HT<sub>1D</sub>, 5-HT<sub>2A</sub>, 5-HT<sub>2C</sub>, and 5-HT<sub>3</sub>) (13,14).

## **Complications**

An overall decline in financial, social, and legal well-being is often linked to pathologic gambling disorder. Significant complications include depression, debt, divorce (the "3 Ds"), job loss, and incarceration. Rates of past-year job loss are twice as high in patients with pathologic gambling disorder (13.8%) as in nongamblers (5.5%). Rates of having

filed for bankruptcy are four times as high in those with the disorder (19.2%) as in nongamblers (4.2%) (15). Similarly, rates of divorce (53.5%) and incarceration (21.4%) are much higher in patients with pathologic gambling disorder than in nongamblers, who have a divorce rate of 18.2% and an incarceration rate of 0.4% (15). One third of the annual cost of pathologic gambling disorder represents criminal justice expenses (15).

Casino gambling may pose a particularly high physical health risk compared with other forms of gambling. Of the 398 casino-related deaths in Atlantic City between 1982 and 1986, 83% resulted from sudden cardiac death (15). The rate of second-hand smoke exposure for nonsmoking casino employees and gamblers is high. Observed physiologic changes related to stress during gambling include fluctuations in cortisol, epinephrine, noradrenergic metabolites, blood pressure, heart rate, and immune system modulators (15).

## **Treatment**

Prochaska (16) has researched how patients with addiction view and approach their illness psychologically, including their ideas for changing their maladaptive behaviors. This model of behavioral change supports the theory that recovery from addiction involves a process (rather than an event) that unfolds gradually over time through a series of specific, yet fluctuating, stages of change. The role of the physician in treating pathologic gambling disorder consists of pinpointing the patient's stage of change, providing a brief intervention, presenting information about Gamblers Anonymous, making a referral for specialty care, and offering supportive measures and pharmacotherapy.

A central outcome measure when treating this disorder is abstinence from (or a significant reduction in) gambling behaviors and gambling-related complications. Primary psychosocial treatments include participation in Gamblers Anonymous and psychotherapy. Gamblers Anonymous is based on the 12 steps of Alcoholics Anonymous and modified to the recovery of pathologic gamblers. Gamblers Anonymous, an abstinence-based program founded in 1955, has more than 1,000 national chapters that hold meetings in all 50 states. Its Web site has an interface that allows the user to find a list of local meeting places and times by entering a city and state.

Gamblers Anonymous can also provide free financial, legal, and employment assistance. Both individual and group therapies are efficacious, but cognitive behavior therapy has the best empirical support for treatment of pathologic gambling disorder. Few well-designed pharmacotherapy studies of pathologic gambling have been conducted. Many studies are limited by small sample sizes and the lack of reliable and valid outcome measures. Four potentially efficacious classes of medications that have been studied are tricyclic antidepressants, selective serotonin reuptake inhibitors, opioid antagonists, and mood stabilizers.

The first tricyclic antidepressant studied was the serotonergic agent clomipramine hydrochloride, a drug previously used in treatment of obsessive-compulsive disorder

(OCD). In a double-blind protocol, patients with pathologic gambling disorder were given clomipramine, 125 mg/day (17). Significant improvement in gambling symptoms was seen, which suggests that pathologic gambling may share biologic pathophysiologic factors with OCD.

Two placebo-controlled studies of fluvoxamine maleate, one single-blind and one double-blind (both using an average dose of 207 mg/day), showed reduction in gambling behaviors (17). However, in a third placebo-controlled study, improvement with fluvoxamine, 200 mg/day, was limited to male or young patients with pathologic gambling disorder (17). Another study that compared fluvoxamine plus psychotherapy with psychotherapy alone demonstrated greater improvement in pathologic gambling scores in subjects treated with a combination of fluvoxamine and psychotherapy (17).

In a double-blind, placebo-controlled study using paroxetine, 20 to 60 mg/day (18), patients showed an improvement over placebo in outcome measures. However, another placebo-controlled, multicenter, randomized controlled trial (18) did not demonstrate superior efficacy of paroxetine, 10 to 60 mg/day, over placebo. In an open-label study of citalopram hydrobromide (dose not reported) (19), four patients were either "much improved" or "very much improved" after treatment. In a small, open-label study (20), bupropion hydrochloride, 300 mg/day, showed potential efficacy in symptoms of both pathologic gambling and attention-deficit/hyperactivity disorder.

Naltrexone hydrochloride (ReVia), which is approved by the US Food and Drug Administration (FDA) for treatment of alcohol and heroin dependence, has been found to be helpful in treating pathologic gambling disorder. A double-blind, placebo-controlled study (21) showed that naltrexone, 188 mg/day, improved outcome. Naltrexone has also been suggested as efficacious in several other papers. Hepatotoxicity from naltrexone is unlikely, but liver function tests should be monitored periodically. Mood stabilizers have been used less often in treatment of pathologic gambling disorder; studies involve only case series and reports.

Although no medications are FDA-approved for treatment of pathologic gambling disorder, a combination of pharmacotherapy and addiction counseling likely affords the best outcome. Screening for comorbid conditions, such as mood, anxiety, and substance use disorders (including nicotine use), is central to optimizing patient outcomes. Patients should be referred to Gamblers Anonymous, and their family members should be directed to Gam-Anon. Physicians need to address the financial concerns unique to this population through referral to Gamblers Anonymous "pressure relief" sessions, consumer credit organizations, or bankruptcy lawyers.

Physicians also need to determine a patient's particular stage of change and continue to be involved in all aspects of treatment. Referral may be made to either a physician certified in addiction medicine or addiction psychiatry or an addiction counselor, or both, when a diagnosis of pathologic gambling is made or function is impaired, or both.

## **Course and prognosis**

Pathologic gambling disorder is a chronic, progressive disorder featuring frequent relapses. Gambling-related behaviors increase gradually until severe financial and personal losses force the gambler to seek help. However, this disorder is highly treatable by emphasizing relapse prevention.

## Conclusion

Pathologic gambling disorder is a growing public health concern with serious societal, family, and individual complications. It is a brain disease that is easily screened for and treatable through participation in Gamblers Anonymous, psychotherapy, and medication use. Because pathologic gambling disorder represents a model of impulse dyscontrol akin to substance use disorders but without known neurocognitive decline as a result of long-term drug exposure, it is an ideal subject for future neurobiologic research. Steady developments in understanding its pathophysiologic factors and treatment are expected.

### Additional resources

Gamblers Anonymous  
PO Box 17173  
Los Angeles, CA 90017  
800-266-1908  
<http://www.gamblersanonymous.org>

Gam-Anon  
PO Box 157  
Whitestone, NY 11357  
718-352-1671  
<http://www.gam-anon.org>

### WAGER OFTEN: A mnemonic for diagnosing pathologic gambling disorder\*

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|----------|---|
| <b>W</b> | ithdrawal. Feels restless or irritable when attempting to reduce or stop gambling ( <i>DSM-IV-TR</i> criterion 4)   |
| <b>A</b> | ffects relationships. Has jeopardized or lost a significant relationship, job, or educational or career opportunity because of gambling ( <i>DSM-IV-TR</i> criterion 9) |
| <b>G</b> | oal is to get even by chasing losses. Gambles again to break even after losing money gambling ( <i>DSM-IV-TR</i> criterion 6)   |

<b>E</b>	scape. Gambles as a way to escape problems or relieve dysphoric mood, helplessness, guilt, anxiety, or depression ( <i>DSM-IV-TR</i> criterion 5)
<b>R</b>	escue. Relies on others to be rescued financially ( <i>DSM-IV-TR</i> criterion 10)
<b>O</b>	utside the law. Has committed illegal acts, such as forgery, fraud, theft, or embezzlement, to finance gambling ( <i>DSM-IV-TR</i> criterion 8)
<b>F</b>	ailure to control. Has made repeated unsuccessful efforts to reduce, control, or stop gambling ( <i>DSM-IV-TR</i> criterion 3)
<b>T</b>	olerance. Needs to gamble with increasing amounts of money or risks to achieve the desired excitement ( <i>DSM-IV-TR</i> criterion 2)
<b>E</b>	vades telling the truth. Lies to family members, healthcare providers, or others to conceal the extent of involvement with gambling ( <i>DSM-IV-TR</i> criterion 7)
<b>N</b>	needs to think about next gambling venture. Is preoccupied with reliving past gambling experiences, handicapping or planning the next venture, or thinking of ways to get money with which to gamble ( <i>DSM-IV-TR</i> criterion 1)

*DSM-IV-TR, Diagnostic and Statistical Manual of Mental Disorders, fourth edition revised.*

\*Cannot be better accounted for by a manic episode.

*Information from the American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. 4th ed, rev. Washington, DC: American Psychiatric Association, 2000.*

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