

## PERSPECTIVES

## Gambling

## An Addictive Behavior with Health and Primary Care Implications

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**Over the past several decades, and particularly during the last 10 to 15 years, there has been a rapid increase in the accessibility of legalized gambling in the United States and other parts of the world. Few studies have systematically explored the relationships between patterns of gambling and health status. Existing data support the notion that some gambling behaviors, particularly problem and pathological gambling, are associated with nongambling health problems. The purpose of this article is to provide a perspective on the relationship between gambling behaviors and substance use disorders, review the data regarding health associations and screening and treatment options for problem and pathological gambling, and suggest a role for generalist physicians in assessing problem and pathological gambling. A rationale for conceptualization of pathological gambling as an addictive disorder and a model proposing stress as a possible mediating factor in the relationship between gambling and health status are presented. More research is needed to investigate directly the biological and health correlates associated with specific types of gambling behaviors and to define the role for generalist physicians in the prevention and treatment of problem and pathological gambling.**

**KEY WORDS:** addiction; pathological gambling; treatment; prevention; substance abuse.

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A growing role exists for the evaluation within primary care settings of patients for addictive disorders.<sup>1,2</sup> Gambling is a very prevalent legalized activity that can be considered a non-drug-related behavior with addictive potential. The relative importance of evaluating patients' gambling behaviors in a general medical setting is in part dependent on the associated health risks and benefits. In this article, we discuss the rationale for viewing pathological gambling as an addiction and review the data on the relationship between gambling behaviors and health, including screening for and treatment of problem and pathological gambling. We suggest basic current recom-

mendations for generalist physicians for identification of individuals with problem or pathological gambling, and also suggest interventions that can be used to assist these individuals and their families. We conclude that more research is needed to determine the extent to which and manners in which routine questioning of gambling behaviors in general medical settings may be warranted.

## BACKGROUND AND PERSPECTIVE

## Gambling: Definitions

Gambling can be defined as placing something of value at risk in the hopes of gaining something of greater value. Traditional forms of gambling include wagering in casinos and on lotteries, horse and dog racing, card games, and sporting events. Gambling is a widespread activity, with 86% of the general adult population endorsing lifetime participation in traditional forms of gambling and 52% of adults reporting participation in past-year lottery gambling.<sup>3</sup>

While the majority of people gamble, a minority meet the criteria for a gambling disorder. Pathological gambling (Table 1) represents the most severe pattern of excessive or destructive gambling behavior and is the only gambling-related disorder for which there exist formal diagnostic criteria in the current formulation of the Diagnostic and Statistical Manual of the American Psychiatric Association (DSM-IV-TR).<sup>4</sup> Another term, problem gambling, is often used to describe less-severe but interfering patterns of excessive or destructive gambling, at times inclusive and at others exclusive of pathological gambling (in this article, we will employ the latter).<sup>5</sup>

## Gambling: Prevalence Rates

Rates of gambling participation and problem and pathological gambling have been increasing with the recent increase in availability of legalized gambling options.<sup>3,6-8</sup> A meta-analysis of prevalence studies performed over the last several decades found past-year and lifetime prevalence rates in adults of 1.1% and 1.6%, respectively, for pathological gambling and an additional 2.8% and 3.8%, respectively, for problem gambling.<sup>7</sup> Similar or slightly higher rates have been reported in primary care settings

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**Table 1. Diagnostic Criteria for Pathological Gambling**

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- A. Persistent and recurrent maladaptive gambling behavior as indicated by 5 (or more) of the following:
- (1) Is preoccupied with gambling (e.g., preoccupied with reliving past gambling experiences, handicapping or planning the next venture, or thinking of ways to get money with which to gamble)
  - (2) Needs to gamble with increasing amounts of money in order to achieve the desired excitement
  - (3) Has repeated unsuccessful efforts to control, cut back, or stop gambling
  - (4) Is restless or irritable when attempting to cut down or stop gambling
  - (5) Gambles as a way of escaping from problems or of relieving a dysphoric mood (e.g., feelings of helplessness, guilt, anxiety, depression)
  - (6) After losing money gambling, often returns another day to get even ("chasing" after one's losses)
  - (7) Lies to family members, therapist, or others to conceal the extent of involvement with gambling
  - (8) Has committed illegal acts such as forgery, fraud, theft, or embezzlement to finance gambling
  - (9) Has jeopardized or lost a significant relationship, job, or educational or career opportunity because of gambling
  - (10) Relies on others to provide money to relieve a desperate financial situation caused by gambling
- B. The gambling behavior is not better accounted for by a manic episode
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(6.2% in one study),<sup>9</sup> and consistently higher rates have been observed in other specific populations, including adolescents, individuals in correctional facilities, and people with mental health problems.<sup>6,10-12</sup>

### Pathological Gambling: Addiction or Compulsion?

Two prominent, non-mutually exclusive conceptualizations of pathological gambling classify the disorder as an impulse control disorder lying along an obsessive-compulsive spectrum or like an addiction to a drug.<sup>5,13,14</sup> Although data exist to support each categorization,<sup>5,14,15</sup> large studies of probands with obsessive-compulsive disorder have generally not observed increased rates of pathological gambling<sup>16,17</sup> nor have high rates of obsessive-compulsive disorder been found in large samples of problem or pathological gamblers.<sup>11</sup> For example, the St. Louis Epidemiologic Catchment Area (ECA) Study found an odds ratio of 0.6 for obsessive-compulsive disorder in problem or pathological gamblers as compared with nongamblers.<sup>11</sup> Nonetheless, compulsive features have long been described as a core component of addiction.<sup>18,19</sup> In order to determine more precisely the relationship between "behavioral" addictions, such as pathological gambling, and drug addictions, current investigations into the underlying neurobiologies are being performed (see below).<sup>20</sup>

### Addiction: Gambling and Substance Use Disorders

Beginning with DSM-III-R, there has been a shift in the definition of essential features of substance use disorders, with a greater emphasis on lack of control and a lesser emphasis on tolerance or physical dependence.<sup>19,21</sup> Concurrently, there has been debate regarding the definition of addiction, and the extent to which disorders and behaviors lacking habitual excessive or self-destructive substance use (e.g., pathological gambling) should be classified as addictive.<sup>20</sup> A core feature of addiction is the continued engagement in a behavior despite adverse

consequences.<sup>5,20</sup> This feature is generally accompanied by a diminished control over the behavior and an anticipatory urge or craving state prior to the engagement in the behavior.<sup>20,22</sup> Using these criteria, pathological gambling can be considered an addiction without exogenous substance use.

### Gambling and Substance Use Disorders: Phenomenological Similarities

As with substance use behaviors, there exists a spectrum of gambling-related behaviors ranging from abstinence to recreational gambling to problem gambling (similar to substance abuse) to pathological gambling (similar to substance dependence).<sup>5,23-25</sup> Both commonalities and differences in the natural histories of gambling and substance use disorders have been reported.<sup>26-29</sup> For example, data from the few existing studies performed to date describe a proportion of individuals with problematic gambling or substance use behaviors believing they do not have a gambling- or substance use-related problem and reporting decreased participation in the destructive behavior over time without formal intervention.<sup>26-29</sup> Another proposed similarity is that of telescoping, a process used to describe the gender-specific nature of temporal progression of substance use problems in men and women. Originally described for alcohol dependence<sup>30</sup> and more recently for cocaine and other forms of drug dependence,<sup>31,32</sup> telescoping refers to the phenomenon that women in general begin using substances later in life, but once beginning, progress to dependence more rapidly. Studies of callers to a gambling helpline<sup>33</sup> and individuals in treatment for gambling problems<sup>34</sup> both find results consistent with the applicability of the telescoping phenomenon to individuals with gambling disorders. Analogously, typologies used to describe individuals with alcohol dependence (e.g., Cloninger's Types I and II) have been proposed to have applicability to individuals with gambling problems.<sup>35,36</sup> The distinguishing characteristics of Type II alcoholics (e.g., early-onset, male predominance) have been reported to

have prognostic implications with regard to treatment outcome (e.g., treatment with ondansetron).<sup>37</sup> Given the potential for these typologies in assisting with selection of optimal treatments, more research is needed to substantiate their applicability to problem and pathological gambling and directly investigate within these patient populations the clinical implications.

### **Gambling and Substance Use Disorders: Comorbidity**

High rates of comorbidity have been described between substance use and gambling disorders.<sup>11,12,38</sup> Pathological gambling has been reported up to 2- to 10-fold more frequently in individuals with drug or alcohol use problems than in the general adult population.<sup>39-41</sup> Conversely, high rates of substance use disorders have been described in individuals with gambling problems.<sup>42,43</sup> For example, a recent survey study of 2,638 adults in the United States found an odds ratio of 23.1 for current alcohol dependence with current gambling pathology.<sup>8</sup> An even stronger association between alcohol use and gambling disorders was observed in the higher socioeconomic status group in which having alcohol abuse or dependence increased the odds of being a problem or pathological gambler by a factor of 66.<sup>8</sup> While these odds ratios are of quite significant magnitude, the relatively small number of individuals with pathological gambling in the study (36 subjects with current pathological gambling) lessens the stability of the estimates. Data from a survey of 2,016 adults in Ontario<sup>44</sup> and the St. Louis ECA Study<sup>11</sup> also demonstrate a strong association between alcohol use and gambling. For example, in the ECA study, problem gamblers, as compared with nongamblers, were found to have elevated odds ratios for alcohol use (7.2; 95% confidence interval [95% CI], 2.3 to 23.0) and alcohol abuse/dependence (3.3; 95% CI, 1.9 to 5.6). In addition, elevated rates of nicotine use (2.6; 95% CI, 1.6 to 4.4), and nicotine dependence (2.1; 95% CI, 1.1 to 3.8) were observed,<sup>11</sup> consistent with findings from other large surveys.<sup>44</sup> Disorders comorbid with pathological gambling (e.g., antisocial personality disorder; see gambling and mental health section below) are similar to those commonly observed in individuals with substance use disorders.<sup>14</sup> Even higher rates of these comorbid disorders (e.g., nicotine dependence and antisocial personality disorder) have been observed in substance-dependent patients with pathological gambling as compared to those without.<sup>40</sup> Individuals with both a substance use disorder and pathological gambling have been reported as being more severely impaired than those with a substance use disorder alone. For example, more severe adverse measures of well-being (e.g., higher rates of unemployment, illegal behaviors, and incarceration) were observed in cocaine-dependent subjects with pathological gambling as compared to those without.<sup>40</sup> A survey of 6,308 adult Texans found individuals with both gambling and substance use problems to have higher rates (31.6%) of

legal complications related to drinking or gambling than the groups with only gambling problems (2.1%) or substance use problems (16.4%).<sup>45</sup> The extent to which other comorbid disorders such as antisocial personality disorder or the pathological gambling behaviors per se contribute to the adverse measures warrants additional investigation,<sup>35</sup> and toward this goal the National Gambling Impact Study Commission report recommended the inclusion of gambling components to the annual National Household Survey on Drug Abuse.<sup>24</sup>

### **Gambling and Substance Use Disorders: Biological Similarities**

Common genetic factors have been reported to contribute to pathological gambling and alcohol dependence in men, with 12% to 20% of the variance accounted for by shared genetic factors.<sup>25,46</sup> These estimates are similar to those reported for the shared genetic contributions for marijuana and alcohol use disorders, and less than those for the shared genetic contributions for nicotine and alcohol use disorders.<sup>25</sup> An even stronger genetic link in men between pathological gambling and antisocial personality and conduct disorders has been reported, with between 61% and 86% of the variance for these behaviors determined by shared genetic factors.<sup>46,47</sup>

In addition to genetic commonalities, similar neural systems have been identified as contributing to drug- and gambling-related behaviors.<sup>20,22,48</sup> One of the central pathways implicated in substance dependence and rewarding and reinforcing behaviors in general is the dopaminergic mesocortical limbic system, with core neural connections between the dopamine neurons in the ventral tegmental area and their projection site in the nucleus accumbens. Studies using a spinner wheel with various outcomes were used to examine neural activities underlying the expectancy and experiencing of monetary rewards in humans, and activations were observed in the ventral tegmental area and its projection sites (including the nucleus accumbens), regions previously identified as being activated in cocaine-dependent subjects following administration of cocaine.<sup>49,50</sup> Early results from investigations of cue-induced gambling urges in pathological gambling subjects have identified abnormal functioning of limbic circuitry (including the anterior cingulate cortex) and frontal cortex, regions previously found to be differentially activated in cocaine-dependent subjects during exposure to cocaine cues.<sup>22,51,52</sup> Given the relatively early nature of research of biological investigations into the similarities and differences between substance use disorders and pathological gambling,<sup>53</sup> more research is needed to define more precisely the shared and unique components of drug addictions and "behavioral" addictions like pathological gambling.<sup>20</sup>

## **ADDICTION AND PRIMARY CARE**

The role of the primary care physician in caring for patients with substance use disorders has expanded due

to an increased recognition of the medical basis and deleterious effects of addictive disorders, the development of effective and efficient methods for screening, the identification of promising new techniques for treatment, and the potential of screening and brief intervention to reduce substance use problems.<sup>54</sup> Because of their regular and long-term contact with patients, primary care physicians are in a unique position to recognize patients with addictive disorders, and to provide a menu of treatment options and monitor response to treatment in these patients. For instance, recent surveys indicate that roughly 40 million Americans drink in excess of recommended amounts and approximately 70% of adults visit a physician once every 2 years.<sup>55</sup> As currently exists for screening and treatment of substance use disorders, the potential exists for primary care physicians to have an important role in the assessment of adverse patterns of gambling behaviors.<sup>5,56</sup>

It has been proposed that substance use disorders are chronic medical illnesses and that treatment outcomes are similar to those in other chronic medical conditions, such as diabetes, asthma, and hypertension.<sup>57</sup> Given the commonalities between pathological gambling and substance use disorders reviewed above, we postulate that pathological gambling may best be considered as a chronic medical condition. To evaluate this viewpoint, we conducted a review of the literature describing: 1) the relationship between gambling and health; 2) screening for problem and pathological gambling; and 3) treatment of problem and pathological gambling.

## METHODS

The MEDLINE (1966 to present) database was searched using the MeSH (Medical Subject Heading) and textword "gambling" to identify candidate articles for review. Potential articles were examined to determine if they met the following eligibility criteria: 1) were published in peer-reviewed journals between 1966 and 2001; 2) were written in English and involved humans, 3) discussed the health effects of gambling, 4) discussed screening strategies for problem or pathological gambling, and 5) discussed treatments for problem or pathological gambling. In an effort to minimize the impact of publication bias, abstracts were reviewed from past-year gambling, psychiatry, and addiction scientific conferences (e.g., National Conference on Problem Gambling, College on Problems of Drug Dependence, American Academy of Addiction Psychiatry, American Psychiatric Association, Biological Psychiatry, World Congress of Biological Psychiatry, and the American College of Neuropsychopharmacology). All eligible citations were appraised using a standardized process to identify those related to screening, treatment, and health status.

## RESULTS

The initial MEDLINE search yielded 781 citations. Citations that were listed as addresses, bibliographies,

biographies, classical articles, dictionaries, directories, duplicate publications, editorials, festschrifts, historical articles, interviews, lectures, legal cases, letters, news, periodical indices, published errata, or retracted publications were excluded, leaving 712 citations. MeSH and textword searches for "screening" (MeSH = "Mass screening"), "treatment" (MeSH = "Therapeutics"), and "health" were used in MEDLINE and combined in a "Boolean Or" and subsequently combined in a "Boolean And" to limit the set of MEDLINE citations to 227. All eligible citations were appraised by 2 co-authors (MNP and DAF) to identify those related to health status, screening, and treatment, and 127 publications were selected for further review.

## Gambling and Health: Mental Health

Increased rates of mental health disorders have been reported in problem and pathological gamblers.<sup>11</sup> In the St. Louis ECA study, problem and pathological gamblers as compared with nongamblers were reported to have elevated odds ratios for major depression (3.3; 95% CI, 1.6 to 6.8), schizophrenia (3.5; 95% CI, 1.3 to 9.7), phobias (2.3; 95% CI, 1.2 to 4.3), somatization syndrome (3.0; 95% CI, 1.6 to 5.8), and antisocial personality disorder (6.1; 95% CI, 3.2 to 11.6).<sup>11</sup> In a study of 990 subjects recruited from drug treatment settings and the community, problem and pathological gambling behavior was found to follow temporally the onset of antisocial personality disorder (100% of cases), phobias (86% of cases), and nonstimulant drug dependences (56% to 68% of cases for nicotine, alcohol, and cannabis), and precede temporally cocaine or amphetamine dependences (70% of cases).<sup>58</sup> However, further research is needed to examine the temporal relationships between problem and pathological and comorbid disorders, particularly from studies of longitudinal or prospective design. In the St. Louis ECA study, recreational gamblers as compared with nongamblers were found to have an increased odds of having major depression (1.7; 95% CI, 1.1 to 2.6), dysthymia (1.8; 95% CI, 1.0 to 3.0), somatization syndrome" (1.7; 95% CI, 1.1 to 2.8), antisocial personality disorder (2.3; 95% CI, 1.6 to 3.4), alcohol use (3.9; 95% CI, 2.4 to 6.3), alcohol abuse/dependence (1.9; 95% CI, 1.3 to 2.7), nicotine use (1.9; 95% CI, 1.6 to 2.4), and nicotine dependence (1.3; 95% CI, 1.0 to 1.7).<sup>11</sup> These and other data support the notion that gambling behaviors can be conceptualized along a continuous spectrum ranging from nongambling to recreational to problem to pathological.<sup>3,6,8,11,25,46,59</sup>

Despite the data finding adverse mental health measures in association with gambling, it has been suggested that gambling can also have beneficial effects.<sup>60,61</sup> Gambling involves risk evaluation and decision-making, and this procedure has relevance to many aspects of daily functioning.<sup>62,63</sup> As such, participation by children and adolescents in games of chance may be adaptive in allowing for practice of risk assessment and decision making, processes relevant to many adult

experiences, particularly those involving competitive risk-taking.<sup>64</sup> Gambling in older age groups has been described as a form of adult play behavior, not only providing fun, excitement, and entertainment, but also possibly enhancing memory, problem solving ability, mathematical proficiency, concentration, and coordination.<sup>60</sup> Engaging in certain forms of gambling activities may have desirable interpersonal social benefits; e.g., fraternization during bus trips to casinos, particularly in older adult populations. However, the risks and benefits associated with gambling ventures such as older adult casino trips have not been fully investigated. Research to date has not assessed carefully the risks of specific populations (such as older adults) with regard to frequency of participation in specific gambling behaviors. In general, there exists a need for further research into the health consequences associated with frequencies of participation in specific forms of gambling, particularly those forms in which large proportions of the population engage.

### Gambling and Suicide

High rates of suicidal tendencies have been reported in clinical populations of pathological gamblers, with estimates of attempted suicide in the range of 17% to 24%.<sup>65</sup> Few structured investigations have directly investigated an association between gambling and suicide. One study reported that cities with established casinos have 2-fold (Atlantic City) or 4-fold (Las Vegas) the expected rates of completed suicide for cities of similar demographic composition.<sup>66</sup> Available data were consistent with an increase from the expected rates following the introduction of casinos (data only available for Atlantic City).<sup>66</sup> However, the interpretation of the data has been challenged, particularly given complexities of making population-based estimates in cities with high rates of noninhabitant visitation. The St. Louis ECA study found no association between problem/pathological gambling and suicidal tendencies in the general population,<sup>11</sup> and a controlled pilot study of Marines found a negative correlation between a history of gambling participation and attempted or completed suicide.<sup>12,67</sup> Taking the data together, the relationship between different levels and types of gambling and suicidal thoughts and behaviors is at present incompletely understood and warrants further investigation.

### Gambling and Social Well-Being

Research has been performed to investigate the relationship between problem and pathological gambling and general measures of social well-being. Recently, the National Opinion Research Center surveyed 2,417 adults and an additional 530 adult gambling venue patrons to determine the gambling-related attitudes and behaviors of U.S. citizens.<sup>3</sup> In addition to high rates of mental health problems and poor general health, high rates of job loss, divorce, bankruptcy, arrest, and incarceration were found to be associated with problem and pathological gambling.

For example, rates of past-year job loss were higher in both problem and pathological gamblers (10.8% and 13.8%, respectively) than in low-risk or nongamblers (5.8% and 5.5%, respectively).<sup>3</sup> Rates of divorce were 39.5% and 53.5% in problem and pathological gamblers, respectively, as compared with 29.8% in low-risk gamblers and 18.2% in nongamblers.<sup>3</sup> Rates of having filed for bankruptcy were 10.3% and 19.2% in problem and pathological gamblers, respectively, and 5.5% and 4.2% in low-risk gamblers and nongamblers, respectively.<sup>3</sup> Rates of arrest and incarceration, respectively, were 32.3% and 21.4% in pathological gamblers, 36.3% and 10.4% in problem gamblers, 11.1% and 3.7% in low-risk gamblers, and 4.5% and 0.4% in nongamblers.<sup>3</sup> The cost of problem and pathological gambling to the United States was \$5 billion annually, with approximately one third of the costs attributable to criminal justice costs.<sup>3</sup> Individual lifetime impact costs were estimated at \$10,550 for pathological gamblers and \$5,130 for problem gamblers, respectively.<sup>3</sup> These costs to society likely underestimate the true costs. For example, the costs attributed to the increased divorce rates were calculated as the associated legal fee estimates and did not take into account impact on spouse, children, and others affected through the divorce. Despite the widespread prevalence of gambling, systematic studies have not yet investigated directly over time the beneficial and detrimental effects associated with different levels of gambling behaviors.<sup>60</sup> More research is needed to specify the nature of the relationships (e.g., cause and effect, timecourse) between different levels of gambling and measures of social well-being.<sup>27</sup>

### Gambling and Health: Casino Gambling and Cardiac Arrest

Casino gambling is a widespread activity. It is estimated that 29% of the general adult U.S. population has gambled at a casino within the last year, and this rate represents an approximately 3-fold increase from that of 10% in 1975.<sup>3</sup> Despite the high rate, few investigations have systematically studied potential morbidity and mortality associated with casino gambling. One investigation found high rates of second-hand smoke exposure in nonsmoking casino employees.<sup>68</sup> Given the high rates of tobacco smoking in casino employees<sup>68</sup> and nicotine dependence in recreational and problem and pathological gamblers,<sup>11</sup> further investigation is warranted into the potential for tobacco-related health risks in casinos and other gambling venues. A review by the Chief Medical Examiner of 398 casino-related deaths in Atlantic City from 1982 to 1986 found 83% to be sudden cardiac deaths. Although the authors concluded that "gambling-related activities can be hazardous to one's health, especially among elderly cardiac patients,"<sup>69,70</sup> the extent to which the finding represents an elevation in risk for cardiac arrest remains to be investigated directly. However, given that the use of on-site automated external defibrillators in casinos was found to enhance survival rates following

cardiac arrest,<sup>71</sup> the data suggest routine use of these devices at casinos should be considered.

### **Gambling and Health: Stress as a Moderating Factor**

A recent study suggests a biological mechanism for cardiac arrests in casinos, one due to physiological changes produced by sustained stress during gambling.<sup>72</sup> Sustained stress and hypertension are generally accepted risk factors for cardiac arrest and sudden cardiac death.<sup>73,74</sup> Significant, persistent (over hours) increases in salivary cortisol and heart rate have been reported in habitual male gamblers during casino blackjack gambling.<sup>72</sup> Other investigations have similarly observed stress-related alterations related to gambling: 1) autonomic arousal and immune system changes (alterations in T-cells and natural killer cells) in habitual male pachinko players during gaming<sup>75</sup>; 2) higher levels of noradrenergic metabolites in males with pathological gambling<sup>76,77</sup>; and 3) higher epinephrine and cortisol levels and blood pressure differences approaching statistical significance on days in which gambling behavior was concentrated.<sup>78</sup> These data raise the possibility that stress associated with gambling contributes to high rates of poor mental and physical health reported by individuals with problem or pathological gambling<sup>3</sup> and cardiac arrests in casinos. Further studies are warranted to investigate directly the relationship between stress and specific physical and mental health problems in different populations of gamblers.

### **Interventions for Problem and Pathological Gamblers: Self-help**

Although unstructured studies suggest comparable outcomes for gambling and substance use treatment programs,<sup>79</sup> few controlled trials have been performed to identify safe and effective treatments for pathological gambling.<sup>5</sup> Gamblers Anonymous (GA), founded in 1957, represents historically the most widely-available form of help accessible for individuals with gambling problems. Based on the 12-step philosophy originally used in Alcoholics Anonymous, GA has chapters throughout the world and can be accessed by telephone (1-800-266-1908) or internet (<http://www.gamblersanonymous.org>). Although GA has been helpful by report of many participants, a structured investigation found that only 8% of individuals entering GA were attending at 1 year, with the majority discontinuing after 1 or 2 meetings.<sup>80</sup> These results, which are similar to those from outcome studies of 12-step programs for individuals with substance use disorders, indicate that additional interventions will likely be needed to optimize outcome.<sup>81</sup> In addition to self-help groups for problem and pathological gamblers, similar options are available for friends, family members, or others affected by people with gambling problems through Gamanon (1-718-352-1671 or <http://gamblersanonymous.org/gamanon>).

### **Interventions for Problem and Pathological Gamblers: Behavioral Therapies**

Structured behavioral therapies for the treatment of pathological gambling are beginning to be examined.<sup>82</sup> Imaginal desensitization, cognitive behavioral therapy, and motivational enhancement have been shown to be effective in small- to moderate-sized controlled trials.<sup>83-86</sup> Several of these trials document improvement sustained in the groups receiving the therapies for prolonged periods following treatment intervention; e.g., pathological gamblers receiving cognitive behavioral therapy showing gains 6 and 12 months following intervention and those receiving motivational enhancement gains at 3 and 6 months.<sup>84-86</sup> Despite these encouraging results, the general applicability of these techniques awaits the completion of larger-scale, controlled trials, some of which are currently underway.<sup>82</sup> As structured, empirically-validated behavioral treatments emerge and become incorporated into professional mental health care treatment settings, a role for primary care physicians in identifying individuals with gambling problems and referring them for treatment will become increasingly important. Presently, information regarding professional treatment options (e.g., for certified gambling counselors) can be obtained in the United States through the National Council on Problem Gambling's gambling helpline (1-800-522-4700) or website (<http://www.ncpgambling.org>).

### **Interventions for Problem and Pathological Gamblers: Pharmacotherapies**

There do not exist currently any medications that have been approved by the Food and Drug Administration for the treatment of pathological gambling. Over the past several years, small- to moderate-sized, randomized, short-term, placebo-controlled, and, with the exception of one study, flexible-dosing clinical trials have been performed to investigate the efficacy and tolerability of specific pharmacotherapies in the treatment of pathological gambling (Table 2).<sup>87,88</sup> Of the medications tested, 2 selective serotonin reuptake inhibitors (SSRIs; fluvoxamine<sup>89</sup> and paroxetine<sup>90</sup>), a  $\mu$ -opioid antagonist (naltrexone<sup>91</sup>), and a mood stabilizer (lithium<sup>92</sup>) have been demonstrated to be superior to placebo in the short-term treatment of individuals with pathological gambling. Of these, the SSRIs and naltrexone trials excluded individuals with significant co-occurring mental health/substance use disorders (excluding nicotine dependence) and improvement in gambling symptomatology and overall clinical status was observed in the absence of significant changes in measures of mood and anxiety.<sup>89-91</sup> A trial of lithium included only bipolar spectrum subjects with pathological gambling, exclusive of psychotic disorders, and improvement was observed in measures of gambling, mania, and general clinical status.<sup>92</sup> A placebo-controlled trial of the atypical antipsychotic drug olanzapine in the treatment of video poker pathological gamblers did not demonstrate improved efficacy over placebo, although differences in

Table 2. Randomized, Placebo-controlled, Double-blind Drug Trials in the Treatment of Pathological Gambling

Category	Reference	Drug	Sample Size	Duration	Average EOS Active Dose mg/d ( $\pm$ SD)	Outcome
Selective serotonin reuptake inhibitors (SSRIs)	Hollander et al., 2000 <sup>89</sup>	Fluvoxamine (Luvox)	15 Subjects enrolled, 10 completed	16-wk (crossover design, 8 wk each of active/placebo with initial 1-wk placebo lead-in)	195 ( $\pm$ 50)	7 of 10 completers determined to be responders by PG-CGI and PG-YBOCS scores; Fluvoxamine superior to placebo, particularly at end of 16 wk of treatment
	Kim et al., in press <sup>90</sup>	Paroxetine (Paxil)	53 Subjects enrolled, 45 randomized, 41 completed (20 paroxetine, 21 placebo)	8-wk, parallel design, with 1-wk placebo lead-in	52 ( $\pm$ 13)	Paroxetine group significantly improved as compared with placebo as determined by CGI, G-SAS
Opioid antagonists	Kim et al., 2001 <sup>91</sup>	Naltrexone (ReVia)	89 Subjects enrolled, 45 completed (20 naltrexone, 25 placebo)	12-wk parallel design, with 1-wk placebo lead-in	188 ( $\pm$ 96)	Naltrexone group significantly improved as compared with Placebo as determined by CGI, G-SAS; risk of LFT abnormalities with analgesics
Mood stabilizers	Hollander et al., 2001 <sup>92</sup>	Sustained-release lithium (Lithobid)	37 Bipolar-spectrum subjects enrolled, 26 completed (10 lithium, 16 Placebo)	10-wk, parallel design	1,170 ( $\pm$ 221)	Lithium group significantly improved as compared with Placebo as determined by PG-CGI, PG-YBOCS and CARS-M scores; 9/10 lithium-treated completers rated as responders
Antipsychotics	Rugle et al., 2001 <sup>93</sup>	Olanzapine (Zyprexa)	23 Video-poker gamblers enrolled, 21 completed (9 olanzapine, 12 placebo)	7-wk, parallel design (nonflexible, escalating dosing strategy)	10 ( $\pm$ 0)	No significant between-group drug effect differences found on measures of changes in gambling urges (GCS) or behavior (Glog)

EOS, end-of-study; SD, standard deviation; mg/d, milligrams per day; PG-CGI, Clinical Global Impression Scale for Gambling Behavior; PG-YBOCS, Yale-Brown Obsessive Compulsive Scale Modified for Pathological Gambling; CGI, Clinical Global Impression Scale; G-SAS, Gambling Symptom Assessment Scale; LFT, liver function test; CARS-M, Clinician-Administered Rating Scale for Mania; GCS, Gambling Craving Scale; Glog, daily gambling behavior log. Modified and reprinted with permission from the chapter "Pathological gambling: clinical aspects and neurobiology" in the forthcoming book Handbook of Medical Psychiatry by courtesy of Marcel Dekker, Inc.<sup>103</sup>

between-group measures of gambling severity at the onset of the trial complicate interpretations.<sup>93</sup>

With regard to pharmacological treatments, several important observations deserve mention. First, as with other treatment trials with other subject groups, a placebo effect has been observed, highlighting the importance of monitoring for gambling-related thoughts and behaviors over time following treatment initiation and limiting the interpretation of open-label studies.<sup>87,89</sup> Second, the doses of SSRIs found to be effective were higher than those generally used to treat major depression and similar to those used to treat obsessive-compulsive disorder. Third, the doses of naltrexone were higher than those used to treat alcohol or opiate dependence and, in conjunction with nonsteroidal anti-inflammatory drugs, were found to be associated with high rates of liver function test abnormalities.<sup>94</sup> Fourth, since many individuals with comorbid mental health/substance use disorders were excluded from the drug treatment trials with the SSRIs, naltrexone, and, to some extent, lithium, the extent to which specific pharmacotherapies are helpful for patients who present with pathological gambling and a co-occurring mental health/substance use disorder remains to be more fully determined. Although the initial results of the short-term, randomized, placebo-controlled drug treatment trials with SSRIs, naltrexone, and lithium appear promising, more data, particularly from large-scale, randomized, placebo-controlled, prospective studies, are needed to determine more precisely the utility of specific drugs in the treatment of pathological gambling.

### Gambling Assessment and Referral in a Primary Care Setting

Relatively few studies have surveyed primary care physicians and other health care affiliates to examine their attitudes, behaviors, and perceived needs in the area of gambling disorders. A survey of 180 health care providers (nurses, physicians, social workers, and other allied health professionals) found 96% reporting knowledge of problem and pathological gambling but only 30% inquiring about gambling problems when a patient presents with stress-related symptoms.<sup>95</sup> A separate structured study collected data from Canadian directors of health ministries, medical school officials, and experts in the area of substance use and gambling disorders to examine office resource needs.<sup>96</sup> Lack of awareness, knowledge, education, and training in the area of pathological gambling was cited as the most important challenge or barrier confronting physicians, and indicated a need for enhanced physician training in substance use and gambling disorders during all levels of medical training, including through Continuing Medical Education courses.<sup>96</sup>

Although relatively few studies have investigated problem and pathological gambling in primary care settings,<sup>5</sup> those that have done so report relatively high rates (e.g., 6.2% in a family medicine setting).<sup>9</sup> Patients have reported a

desire to have a general practitioner broach with them the topic of gambling behaviors, including problem or pathological gambling.<sup>97</sup> General practitioners have generally reported a willingness to intervene in this area, although they also frequently reported not having the expertise to do so.<sup>96,98</sup> Referrals to self-help or professional treatment and following up with patients regarding gambling-related behaviors and treatment could be of therapeutic benefit, as well as referrals for family members possibly affected by a loved one's gambling. However, more research in family and internal medicine settings is warranted to investigate the direct clinical benefit of such interventions.

Although it appears premature to develop guidelines regarding the precise role for generalist physicians in prevention and treatment efforts related to problem and pathological gambling, it is likely that generalists will encounter individuals with gambling problems in their provision of clinical care. As such, efficient screening methods for problematic gambling behaviors would help minimize potential burden. Identification efforts could be assisted by the availability of valid and reliable brief-screening instruments such as the CAGE for alcohol use disorders,<sup>2</sup> and the need for such an instrument was identified in a resource assessment study.<sup>96</sup> Brief screening instruments for problem and pathological gambling are in the stages of development and testing.<sup>97</sup> One instrument, the Lie-Bet Questionnaire, is a 2-question screen that was derived from the 10 inclusionary diagnostic criteria items for pathological gambling and found in 2 studies to have high specificity (85% and 91%) and sensitivity (100% and 99%) in groups enriched for pathological gambling.<sup>99,100</sup> The 2 questions found to distinguish individuals with pathological gambling from those without were: 1) "Have you ever had the need to gamble more and more money," and 2) "Have you ever had to lie to people important to you about how much you gambled."<sup>99</sup> The extent to which the Lie-Bet questionnaire might efficiently screen for problem and pathological gamblers in general mental health and primary care settings requires more direct examination. Another instrument (the EIGHT [Early Intervention Gambling Health Test]; see also [www.cgs.co.nz](http://www.cgs.co.nz)) (Table 3)<sup>97</sup> was specifically designed for use in a primary care setting. The EIGHT begins with a statement to help define which behaviors constitute gambling and progresses to inquire if patients have felt bad (depressed or guilty) about their gambling, withheld from friends or families information about the extent (monetary or temporal duration) of their gambling, encountered criticism about their gambling, experienced financial problems due to their gambling, or felt that they might have a problem with gambling.<sup>97</sup> The EIGHT has been shown in preliminary studies in treatment and forensic settings to have high rates of sensitivity and specificity with respect to more lengthy, standardized screening instruments for problem and pathological gambling, e.g., the South Oaks Gambling Screen.<sup>101,102</sup> Specifically, in a study of 798 general practitioner patients, the EIGHT was found to have sensitivities of 83% and



**Table 3. The Early Intervention Gambling Health Test (EIGHT)**

Most people enjoy gambling, whether it's Lotto, track racing, or at the casino. *Sometimes, however, it can affect our health.* To help us to check your health, please answer the questions below as truthfully as you are able from your own experience.

1. Sometimes I've felt depressed or anxious after a session of gambling.	Yes, that's true	No, I haven't
2. Sometimes I've felt guilty about the way I gamble.	Yes, that's so	No, that isn't so
3. When I think about it, gambling has sometimes caused me problems.	Yes, that's so	No, that isn't so
4. Sometimes I've found it better not to tell others, especially my family, about the amount of time or money I spend gambling.	Yes, that's true	No, I haven't
5. I often find that when I stop gambling I've run out of money.	Yes, that's so	No, that isn't so
6. Often I get the urge to return to gambling to win back losses from a past session.	Yes, that's so	No, that isn't so
7. Yes, I have received criticism about my gambling in the past.	Yes, that's true	No, I haven't
8. Yes, I have tried to win money to pay debts.	Yes, that's true	No, I haven't

75%, specificities of 92% and 95%, and positive predictive values of 38% and 53% for 3-point and 4-point cutoff values, respectively (S. Sullivan, PhD, written communication, January 23, 2001). Further studies are needed to examine the generalizability of these initial findings and determine the utility of the EIGHT in specific primary care settings.

Efforts employed by generalist physicians in the prevention and treatment of problem and pathological gambling could involve the regular assessment of patients' gambling histories, sensitive broaching of the topic of the possible existence of gambling problems with those patients suspected of engaging problematically in gambling, thoughtful motivating of individuals with gambling problems to seek treatment, and appropriate referring and monitoring of gambling-related treatment (see Appendix A).<sup>97</sup> Clinicians should be aware of the high rates of problem and pathological gambling in specific groups; e.g., males, adolescents, and individuals with histories of incarceration or psychiatric (including substance use) disorders. Given the high rates of comorbidity between gambling and other psychiatric disorders, screening of individuals with problem or pathological gambling for other psychiatric disorders (and vice versa) could help in improving diagnosis and providing better treatment recommendations. Additionally, although gambling problems are more prevalent in men than women, clinicians should be cognizant of gender-related differences; e.g., women generally beginning to gamble and developing problems with gambling later in life, and developing problems more frequently with nonstrategic, machine-based forms of gambling such as casino slots.<sup>33,34</sup>

## CONCLUSIONS

Additional research is needed to better define the relationships between patterns of gambling and specific forms of health and illness and the biological processes underlying the relationships. As more information becomes available regarding efficacious, well-tolerated, empirically validated treatments for pathological gambling, the role for generalist physicians in prevention and treatment of problematic forms of gambling behaviors is likely to expand and become better defined.

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## APPENDIX A

### *Early Intervention Gambling Health Test (EIGHT) Gambling Screen*

Developed by Dr. Sean Sullivan for the Compulsive Gambling Society of NZ, Inc., and the Department of General Practice and Primary Health Care at the Auckland School of Medicine

#### Scoring Guide

**Affirmed 4 or more questions:** Gambling is likely to be affecting patient's well-being and may even meet criteria for gambling pathology.

#### Appropriate Intervention

- Indicate the test is not diagnostic, and is just indicative. (Some of the patient's answers may refer to the past and not the present, or may refer to isolated incidents. These would be false positives).
- Intervene (such as using the Motivational Interviewing steps).
- Ascertain level of patient's concern about their gambling—if they have concern, offer an assessment (using DSM-IV-TR criteria)—nb, it is not only gambling pathology that warrants intervention in this progressive behavior, while some DSM-IV-TR criteria are not easily acknowledged because of guilt and shame.
- If their concern is low, offer information; offering of information is appropriate also where gambling pathology exists. Request their permission before offering information—this will enhance acceptance.
- Framing the gambling as a health issue will reduce resistance.
- Offer support—guilt and shame may prevent their discussing their gambling with others.
- Ongoing monitoring—problem gambling is often progressive, with high suicidal ideation, depression, and anxiety in advanced cases (check extent of their answer to question one on the screen).
- 'Sowing the seed' as a possible health matter may prevent progression of gambling behavior even if help is refused.
- Consider alcohol misuse, depression, anxiety, suicidal ideation.

#### Guidelines that May Help

- In offering the screen, emphasize that gambling is a common pastime but that sometimes it can cause health problems and problems socially—this frames the inquiry as health related rather than inquiry into lifestyle.
- The screen is not diagnostic and mistakes can be made—more important is how the patient feels their gambling is affecting their lives; the screen results may assist them to focus on effects that gambling is having on them—avoid terms like compulsive or pathological gambling, even if a subsequent assessment using DSM meets this criteria.
- Refer instead to the screen, suggesting that 'gambling is causing you problems that may be affecting your health or well-being.' This avoids labeling and allows a discussion of an external (health) problem—being the reason patients see their GPs—and avoids focussing on personal behavior and circumventing emotions (guilt, self esteem) that the patient may often defend against.