Int J Ment Health Addiction (2008) 6:249–264
DOI 10.1007/s11469-007-9072-x

How Well are We Helping Problem Gamblers? An Update to the Evidence Base Supporting Problem Gambling Treatment

James R. Westphal

Received: 23 November 2006 / Accepted: 12 April 2007 /
Published online: 1 May 2007

Abstract Evidence based medicine developed to link clinical practice and policy decisions to evidence, so that effective treatments are maximized and ineffective treatments minimized. The objective was to evaluate current status of problem gambling treatment evidence base. The method was literature review of problem gambling treatment articles published from 2003 through 2006. The evidence base for gambling treatment remains limited. No treatment, either psychosocial or pharmacologic fulfills the current standards for efficacy. Articles published in this time period provide more support for the efficacy and effectiveness of cognitive behavioral treatment and use of opioid antagonists. The current evidence base is not sufficient to support the goal of community evidence based treatment. Three types of studies are needed: replication studies of the possibly efficacious treatments by independent investigators, effectiveness studies of the possibly efficacious treatments with community populations and clinicians, and outcome studies of community treatment programs to serve as benchmarks.

Keywords Problem gambling · Problem gambling treatment · Evidence based mental health · Attrition · Non-specific effects of treatment · Evidence grading

Introduction

The increased emphasis on the application of evidence to clinical practice results from multiple factors. The factors include: increasing health care costs, studies documenting dramatic geographic variation in the provision of health care services to similar populations, studies documenting provision of ineffective services, effective services misapplied to inappropriate patient populations and effective services incorrectly delivered and studies documenting effective services that are delivered to small proportions of patients who would benefit. Evidence based medicine was developed to directly link clinical practice and

J. R. Westphal (✉)
Psychiatry, Hawaii State Hospital, University of Hawaii Manoa, 45-710 Keaahala Road, Kaneohe, HI 96744, USA
e-mail: jrwestph@hsh.health.state.hi.us

policy decisions to supporting evidence so that effective treatments can be maximized and ineffective treatments minimized (Woolf 2000).

Evidence based medicine has impacted the provision of health care in multiple jurisdictions across the world. The goal of evidence based health care is to provide a system that can apply the current best evidence from research to the prevention, detection, and care of health disorders (Sackett et al. 1996). Slow dissemination of new evidence based treatments into practice (Mair et al. 1996; Mashru and Lant 1997; Sudlow et al. 1997); and slow extinguishment of practices whose utility has been disproved (Antman et al. 1992) are significant obstacles to achieving this goal (Haynes and Haines 1998). Unfortunately, clinicians often have a slower response to changes in the evidence than other groups, such as, policy makers (Coleman and Nicholl 2001).

Adoption of the principles of evidence based medicine to the field of mental health resulted from the efforts of many mental health professionals in diverse jurisdictions. Some of the first efforts included a report by a Task Force of the American Psychological Association in 1995 (Task Force Promoting Dissemination of Psychological Procedures 1995), the publication of a review of psychotherapy efficacy for the British National Health Service (Parry 1996) and a book on evidence based psychological treatments in the United Kingdom (Roth and Fonagy 1996). Psychologists in Germany (Strauss and Kaechele 1998) and in Canada (Hunsley et al. 1999) also conducted reviews of the evidence base for mental health treatments. More current efforts include Chambless and Ollendick (2001), who review the criteria and development of empirically supported psychotherapies and Davidson et al. (2003) who review the current recommendations for conducting and reporting behavioral clinical trials.

Chambless and Ollendick (2001) succinctly describe the premises of evidence based mental health care as: (1) patient care can be improved by the use of up-to-date empirical knowledge, (2) clinicians have difficulty keeping up with newly emerging information pertinent to their practice, (3), if clinician's knowledge and skills do not stay current, their clinical performance will deteriorate over the years after their training; and (4) clinicians need periodic summaries of evidence provided by expert reviews and/or education on evidence evaluation and periodic application to their practice to maintain their level of clinical performance.

The continuous application of the principles of evidence based health care to the field of treatment of problem gambling will facilitate the provision of effective care in the community. Many parties, including the multiple jurisdictions across the world that provide treatment to problem gamblers (Westphal and Abbott 2006), the clinicians who provide treatment to problem gamblers and the problem gamblers who seek help, have a stake in the development of effective services. The development and application of high quality evidence will encourage high quality, more effective gambling treatment.

Types of Efficacy Criteria

There are different standards for establishing efficacy for different types of treatments. One current standard is a systematic review and meta-analysis of randomized, controlled trials conducted by a Cochrane Collaboration workgroup as described by Lefebvre (1994). The review by Oakley-Browne et al. (2004) on problem gambling treatment used Cochrane methods, but did not find enough qualified randomized controlled trials to make any determination of efficacy. A typical example of a Cochrane review is Srisurapanont and Jarusuraisin (2005) who reviewed 29 randomized controlled trials with over 3,000 total participants and over 1,800 participants taking the active medication to determine the

effectiveness of using naltrexone, an opioid antagonist for patients with alcohol dependency.

The criteria for determining efficacy of a pharmacological treatment from a regulatory perspective are different. For example, the United States Food and Drug Administration (FDA) require both Phase 2 and Phase 3 studies for drug approval (Food and Drug Administration 2005). Phase 2 studies provide initial evidence for efficacy and usually need from "a few dozen to about 300 patients" to compare the investigational medication to placebo or an established medication with efficacy for the disorder. Phase 3 studies are usually a joint design process with the sponsors of the medication, usually a pharmaceutical company, and the FDA. Phase 3 studies usually require "from several hundred to about 3,000" subjects to establish efficacy to the extent that the drug is approved for the disorder (Food and Drug Administration 2005).

The efficacy criteria for a psychosocial therapy are different than the criteria and techniques used for the determination of the efficacy of a medication. Chambless and Ollendick (2001) document the current state of development of the efficacy criteria for psychotherapies by reviewing eight published evaluations with differing terminology and criteria. Chambless and Ollendick (2001) use three categories (well-established, possibly efficacious, and experimental) depending on the number of studies, type of control group, existence of independent replication, sample size and study design.

Status of Problem Gambling Treatment Evidence Base (2004)

The evidence base for problem gambling treatment is limited. Multiple reviews of the gambling treatment literature from 1992 through 2004 (Walker 1992; Blaszczynski and Silove 1995; Lopez Viets and Miller 1997; Oakley-Browne et al. 2004; Toneatto and Ladouceur 2003; Abbott et al. 2004; Toneatto and Millar 2004) have found that no treatment fulfills the current standards of evidence for efficacy.

At the time of the last major reviews (2004), there were several psychosocial gambling treatments that had evidence supporting the 'possibly efficacious' category of Chambless and Ollendick (2001) of at least one randomized controlled trial from one investigator group. The possibly efficacious psychosocial therapies were cognitive therapy as conducted by the Ladouceur group (Ladouceur et al. 2001), brief motivational and self-help intervention as conducted by the Hodgins group (Hodgins et al. 2001), and the cognitive behavioral treatment conducted by the Echeburua group (Echeburua et al. 1996). One pharmacological treatment, naltrexone (an opioid receptor blocker) had evidence (Kim et al. 2001, a double blind, placebo controlled study of 76 participants from five sites) supporting possible efficacy at the time of the last major review.

However, the development of the evidence base is not complete when efficacy is established for a treatment. Effectiveness studies are studies of efficacious treatments, when provided by community clinicians in community settings with typical, diverse clinical populations. Effectiveness studies are necessary for several reasons. Efficacy trials often use very homogenous populations of patients rigidly defined by exclusion and inclusion criteria. The homogenous participants in efficacy studies often are not characteristic of patients treated in clinical practice (Zarin et al. 2005). In addition, psychosocial therapeutic techniques often need significant expertise and training to apply. Efficacious techniques that are misapplied or applied with inappropriate populations are a phenomenon that occurs commonly in health care (Woolf 2000).

Multiple efficacious psychiatric and substance use disorder treatments have encountered difficulties in the transition to clinical practice (Huber et al. 2000; March et al. 2005;

Mattson and Donovan 1994a, b; Mulder et al. 2003). Some efficacious treatments are not more effective when compared to usual community treatment (Rawson et al. 2004), and others demonstrate increased effectiveness in the community (Lydiard et al. 1999). Until effectiveness studies are conducted, the performance of an efficacious therapy in the community is unknown.

Outcome studies are another important component of the evidence base. Outcome studies (controlled or uncontrolled reports of treatment characteristics, number of patients and patient outcomes) for gambling treatment programs are important for quality improvement and benchmarking. The ability to compare outcomes across jurisdictions, patient populations, and types of treatment is important in any type of program evaluation. Both effectiveness and outcome studies are very limited for the field of problem gambling treatment (Shaffer et al. 2005). One of the sparse contemporary outcome studies in the peer reviewed literature at the time of the reviews was Stinchfield and Winters (2001), who presented data on 568 gamblers treated by four state-supported outpatient gambling treatment programs in Minnesota, (US) from 1992 through 1995.

This paper will evaluate the published literature on problem gambling treatment from 2003 through 2006 and assess the advances in the evidence base resulting from the new literature. It also will address what further evidence is needed to fulfill the goal of providing evidence based treatment in the community. The objectives of this paper are (1) to grade the evidence and assess the clinical trial design of gambling treatment studies published from 2003 through 2006, (2) assess impact of the studies published from 2003 to 2006 on the status of the gambling treatment evidence base and (3) to determine the types of future studies needed to develop sound, evidence based treatment of problem gambling in the community.

Materials and Methods

Medline searches were performed to find gambling treatment studies published since 2003. The year 2003 was chosen instead of 2004 (the year of publication of the last major reviews) because of the delays from collecting studies to publication. The literature search strategies used were based on the strategies recommended by Doig and Simpson (2003) and Glanville et al. (2006). Medline searches were conducted on the MESH topics: multi-center studies/methods, randomized controlled trials/methods, program evaluation and the MESH Major topic gambling.

The techniques used to evaluate the evidence base included evidence grading and assessing the clinical trial design. Evidence can be classified into levels based on the rigor of the study methodology and the confidence given to the results. This paper used the Oxford Centre for Evidence-based Medicine Hierarchy of Evidence (Harbour and Miller 2001). Levels range from Level 1 randomized controlled studies, Levels 2 and 3 for controlled but not randomized studies to Level 4 (uncontrolled case series) to Level 5, expert opinion.

Assessment of the quality of the study focused on the type of control and the number of participants. Three recent reviews of problem gambling treatment found small sample size as a systemic factor limiting efficacy studies (Toneatto and Ladouceur 2003; Toneatto and Millar 2004; Westphal and Abbott 2006). This paper used the average number of participants (65) in the six ‘best conducted’ problem gambling treatment studies from Toneatto and Millar (2004) as found by Westphal and Abbott (2006) as a threshold for lower powered studies.

A previous review of the problem gambling treatment literature (Westphal 2007) found lack of comparable control groups as common finding among problem gambling treatment studies. Chambless and Ollendick (2001) use type of control group as one of the study criteria for determining their three categories (well-established, possibly efficacious, and experimental) and Sackett et al. (1998) also use comparable control group as one their criteria for assessment of study quality.

Results

Evidence Grading

Twelve relevant studies (Dannon et al. 2005; Dowling et al. 2006; Grant and Grosz 2004; Grant et al. 2004, 2006; Hollander et al. 2005; Kennedy et al. 2005; Melville et al. 2004; Petry et al. 2006; Rychtarik and McGillicuddy 2006; Saiz-Ruiz et al. 2005; Shaffer et al. 2005; Wulfert et al. 2006) were found. Two studies (Grant et al. 2006; Petry et al. 2006) were Level 1 evidence, randomized and controlled clinical trials with adequate participant numbers. Five studies were Level 1 evidence with smaller numbers of participants (Dannon et al. 2005; Hollander et al. 2005; Melville et al. 2004; Rychtarik and McGillicuddy 2006; Saiz-Ruiz et al. 2005). Two studies (Dowling et al. 2006; Wulfert et al. 2006) were controlled, but not randomized and were graded as Level 2 evidence (Harbour and Miller 2001). Four studies described community treatment programs (Grant et al. 2004; Grant and Grosz 2004; Kennedy et al. 2005; Shaffer et al. 2005) for problem gambling and reported outcomes of community gambling treatment and were graded as Level 4 evidence (Harbour and Miller 2001). Table 1 provides a summary of the evidence grading and evaluation of study design results.

The Level 1 reports had significant variation in methodological quality and number of participants and produced both positive and negative results. The studies generally had small numbers of subjects with the exception of Grant et al. (2006) and Petry et al. (2006). Five of the Level 1 studies with smaller numbers of participants were considered to provide pilot study evidence for the treatments studied. One of the Level two studies described a

Table 1 Study Characteristics

First Author	Year	Evidence Level	Control Group	Number of Participants
Grant	2006	1	Placebo	207
Petry	2006	1	GA referral	231
Saiz-Ruiz	2005	1	Placebo	60
Hollander	2005	1	Placebo	40
Dannon	2005	1	Comparison of two treatments	30
Melville	2004	1	Waiting group, group therapy	42
Rychtarik and McGillicuddy	2006	1	Delayed treatment	23
Dowling	2006	2	Usual treatment	9
Wulfert	2006	2	Usual treatment	19
Grant	2004	4	n/a	50
Grant and Grosz	2004	4	n/a	14
Kennedy	2005	4	n/a	35
Shaffer	2005	4	n/a	3,200

pilot effectiveness study of cognitive behavioral treatment in a community setting. The Level 4 studies are useful in documenting treatment approaches available in the community and provide data useful for benchmarking community treatment outcomes. Each study will be individually reviewed and discussed.

Summary of Level 1 Studies with Adequate Numbers of Participants

Petry et al. (2006) published a study of 231 pathological gamblers treated with cognitive behavioral therapy. The participants were randomly assigned to (1) referral to Gamblers Anonymous (GA), (2) GA referral plus a cognitive–behavioral workbook, or (3) GA referral plus eight sessions of individual cognitive–behavioral therapy. Cognitive–behavioral treatment reduced gambling behavior relative to the control (GA referral) during the treatment period and resulted in clinically significant improvements, with some effects maintained throughout follow-up.

The study's methodological quality was sufficient and the number of participants was exemplary, especially for a study of a psychosocial treatment. The control group (GA referral) was an active treatment rather than a passive waiting group, decreasing the chances that the difference among the groups was due to patient motivation or attention. The study provides more evidence for the efficacy of cognitive–behavioral treatment, especially since the treatment evaluation was performed by a different investigator. In addition, the study provided support for a dose response effect for the cognitive–behavioral therapy since individual cognitive–behavioral therapy improved some outcomes compared with the cognitive–behavioral workbook and a higher number of cognitive–behavioral therapy sessions or workbook exercises completed were associated with gambling abstinence. Unfortunately, it cannot be considered a replication of the cognitive behavioral methods of Echeburua et al. (1996), since the manual prepared by that group (Fernandez-Montalvo and Echeburua 1997) was not used to develop the therapy.

Grant et al. (2006) treated 207 pathological gamblers at 15 sites with the opioid antagonist nalmefene and placebo for 16-weeks. The study used an oral form of this medication that is commercially available only in parenteral (injectible) form to treat opioid overdose. The design was a randomized, dose-ranging (doses of 25, 50 and 100 mg per day), double-blind, placebo-controlled trial conducted at 15 outpatient treatment centers across the United States. The primary outcome measure was the Yale–Brown Obsessive Compulsive Scale Modified for Pathological Gambling (YBOCS-PG). The 25 and 50 mg/day nalmefene groups had scores that were statistically significant in their difference compared to the placebo group. A total of 59.2% of the subjects who received 25 mg/day of nalmefene were rated as "much improved" or "very much improved" at the last evaluation, compared to 34.0% of those who received placebo. Low-dose nalmefene (25 mg/day) appeared efficacious and was associated with few adverse events. Higher doses of nalmefene (50 and 100 mg/day) resulted in intolerable side effects.

The study's methodological quality was sufficient and the number of participants was exemplary for a study of pathological gambling, but average in participant number for a multi-site pharmacological study. The study can be criticized for the reliability and validity of the outcome measure (YBOCS-PG) and possible breaking of the double blind by observation of side effects by the patients or proscribing physician as Toneatto and Ladouceur (2003) observed. This study adds to the evidence base supporting the use of opioid antagonists among pathological gamblers. Unlike naltrexone, the other opioid antagonist studied with pathological gamblers, nalmefene seems to be effective in a dose

range that minimizes side effects. The clinical use of this medication is problematic, as the oral form of nalmefene used in this study is not commercially available in most jurisdictions.

Summary of Level 1 Pharmacological Studies with Lower Numbers of Participants

Saiz-Ruiz et al. (2005) studied 60 pathological gamblers for 6 months in a double-blind, flexible-dose, placebo-controlled study with sertraline (a serotonin reuptake inhibitor antidepressant). The study used the Criteria for Control of Pathological Gambling Questionnaire (CCPGQ) as the primary outcome measure. Both groups (sertraline and placebo) had high response rates (74 and 72%). The difference did not have statistical significance. This is a negative study for sertraline as a treatment for pathological gambling.

Hollander et al. (2005) studied a unique subgroup of pathological gamblers, those with bipolar spectrum disorders. The design was a randomized placebo controlled trial of 40 patients treated with sustained-release lithium carbonate or placebo for 10 weeks. The major outcome measures were the YBOCS-PG, the Clinical Global Impression, Severity of Pathological Gambling Scale and the Clinician-administered Rating Scale for Mania (affective instability). Ten (50% using intention to treat analysis) of 12 completers were rated as responders in the sustained-release lithium group versus five (25% using intention to treat analysis) of 17 in the placebo group. Improvement in gambling severity was significantly correlated with improvement in mania ratings. This study is unique in both identifying a subgroup of pathological gamblers by their co-occurring psychiatric disorders for a specific pharmacological treatment and also identifying a target symptom, not directly related to gambling, (elevated mood).

Dannon et al. (2005) compared the effectiveness of topiramate (an anticonvulsant) and fluvoxamine (a serotonin reuptake inhibitor antidepressant) in the treatment of 30 pathological gamblers in a 12 week study. The topiramate treated patients reported a 60% "full remission" rate while the fluvoxamine treatment group reported a 40% "full remission" rate. Unfortunately, the study did not have enough participants and, thus, not enough power to show a statistically significant difference. This study lacked a placebo control, making it very difficult to interpret, since it compared two medications with unknown efficacy in a disorder with a known high placebo response rate (Westphal and Abbott 2006). At best, this study could be considered pilot data supporting further study of topiramate in the treatment of pathological gambling.

The results of the previous pharmacological trials are mixed. The study of sertraline (Saiz-Ruiz et al. 2005) is a negative study and the topiramate study provides pilot data. The study of extended release lithium among patients with bipolar spectrum and pathological gambling provides support for further trials of this medication in a defined subgroup of pathological gamblers. Unfortunately, the size and clinical relevance of this subgroup of pathological gamblers is unknown. A recent review, by Kim et al. (2006) found that patients with co-occurring manic disorder may comprise 25% of pathological gamblers, while patients with co-occurring depressive disorders comprise over fifty% of pathological gamblers. However, the size of the subgroup of bipolar spectrum pathological gamblers as defined by Hollander et al. (2005) is unknown. The subgroup could be in the range of 25% to 50% which would be clinically significant. All three of the previously described pharmacological trials also can be also criticized on the reliability and validity of their outcome measures and possible breaking of the blinding, secondary to side effects (Toneatto and Ladouceur 2003).

Summary of Level 1 Psychosocial Studies with Lower Numbers of Participants

Melville et al. (2004) reported on two experiments that randomized pathological gamblers to a waiting list control, group therapy or group therapy using node-link mapping. A total of 23 patients participated in the node link mapping and 19 in the control conditions. The largest trial with 19 total subjects used a passive type control, a waiting list group. Node link mapping is a visual graphing strategy (Pitre et al. 1998). Nodes contain ideas, actions, and feelings; and are connected by links that illustrate meaningful relationships. The graphic approach is used to visualize problems and solutions. Node-link mapping was developed in the substance use disorder treatment field, specifically for group treatment (Czuchry and Dansereau 1999; Pitre et al. 1998).

Rychtarik and McGillicuddy (2006) developed a coping skills training program for individuals living with a pathological-gambling partner and evaluated the effects on 23 study participants whose partner who was not in treatment. The design was a random allocation to a waiting list control or the active treatment. Treatment consisted of ten, weekly individual sessions focused on teaching effective coping skills. The treatment group had a large improvement in coping skills and large statistically significant reduction in depression and anxiety. There were no differences in partner gambling or partner help-seeking during the evaluation period.

Although these studies were randomized and controlled, the small number of subjects and the non-equivalent control groups in both studies leads to the classification of both of these reports as pilot studies. The methodological issues with waiting list controls will be discussed more fully in the section on non-specific response to treatment. Both node linked therapy and coping skill training for partners of problem gamblers have some evidence to support further trials.

Level 2 Studies

Two studies that were controlled, but not randomized were reported (Dowling et al. 2006; Wulfert et al. 2006). Wulfert et al. (2006) studied nine pathological gamblers treated with a hybrid intervention (motivational enhancement and cognitive behavior therapy) and compared them to a cohort of gamblers who received treatment as usual in the same community setting. All of the gamblers in the hybrid treatment were retained in treatment and the 12 month follow-up period, which was significantly higher than the retention rate of the control group. The majority of the gamblers in the hybrid treatment maintained total abstinence or were significantly improved at the 12-month follow-up assessment and made lifestyle changes.

Dowling et al. (2006) treated 19 female pathological gamblers with cognitive–behavioral methods compared to a waiting list control. The patients treated with cognitive–behavioral methods showed statistically significant improvement on gambling behavior and psychological functioning measures at treatment end and at 6 month follow-up evaluation.

Level 2 studies have methodological limitations. Studies using controls that are not randomized are susceptible to bias and confounding, even when conducted faithfully to their protocols (Reeves, 2004) and this type of study provides evidence for association, not cause and effect (Sibbald and Roland 1998; Kennedy and Frankowski 2003).

Despite the limitations of the study, Dowling et al. (2006) provides one of the first effectiveness studies of a possibly efficacious treatment (cognitive behavioral) in a community setting compared with standard community treatment. The study provides evidence that cognitive behavioral treatment of female pathological gamblers is associated

with improved treatment outcomes compared to usual community treatment. This is one in a series of studies that will be necessary to fulfill the goal of evidence based treatments of providing effective treatments in the community.

Toneatto and Millar (2004) and Petry (2005a) both recommend stage of change assessment and interventions to strengthen motivation among gamblers in treatment. Wulfert et al. (2006) describe a treatment that combines a possibly efficacious treatment with motivation enhancement. However, there are mixed results for this combined approach. Milton et al. (2002) using a stronger randomized and controlled design and larger numbers of participants also found improved treatment retention with the combined approach, but there were no differences in outcomes at 9 month follow up between the combined treatment and cognitive behavioral treatment only. At this point, the evidence from the better designed and powered study is negative for this approach.

Level 4 Studies

Four studies reported outcomes of community treatment of problem gambling Grant et al. 2004; Grant and Grosz 2004; Kennedy et al. 2005; Shaffer et al. 2005). Grant et al. (2004) reported on retrospective chart review of outpatient pharmacological treatment at a US academic medical center (serotonin uptake inhibitors, naltrexone and combinations of serotonin uptake inhibitors and naltrexone) of 50 pathological gamblers. Their primary outcome measure was attrition. Their cohort had a 48% attrition rate.

Grant and Grosz (2004) retrospectively assessed 14 pathological gamblers age 60 years and older with the Clinical Global Impressions scale (both severity and improvement measures). The treatment modality was outpatient pharmacotherapy. Eight patients in their study (57.1%) achieved sustained response.

Kennedy et al. (2005) describes a US military gambling treatment program housed within the Substance Abuse Rehabilitation Program at the US Naval Hospital in Okinawa, Japan. The program treated 35 young adult patients, mostly males in the first year of operation. Significant co-occurring depressive symptoms, suicidal ideation, and substance use disorders were found in their sample. The program was evaluated as effective in preventing suicides and in facilitating the retention by the authors.

Shaffer et al. (2005) describes the outcomes of the Iowa (US) Gambling Treatment Program with data on over 2,300 patients over 4 years from 1997 through 2001. The treatment provided was outpatient multimodal including group and individual therapy. A substantial proportion of their sample did not complete treatment (83%). They found a dose response effect of treatment with 74% of the treatment completers, 49% of the substantial treatment completers, and 36% of dropouts and referrals abstaining from gambling at the 6 month follow-up assessment. This study is important because of its comprehensive reporting of outcomes in a large number of participants over a long duration.

Before discussing the Level 4 evidence, the limitations of descriptive research, such as, case series will be reviewed. The scientific value of descriptive research is controversial (Hoffman 1999; Vandenbroucke 2001). The most important but rarely acknowledged limitation of descriptive reports is that it does not allow inferences about cause and effect or associations because of the lack of a control group (Grimes and Schulz 2002a, b; Carey and Boden 2003). For the field of problem gambling treatment, these studies can be important in the study of the mechanism of treatment, generating hypotheses and quality improvement efforts (Vandenbroucke 2001). Studies providing Level 4 evidence cannot be used to determine treatment effects; however, the data provided by these studies can be used for benchmarking in quality improvement efforts of problem gambling treatment programs.

The treatment results and attrition rates of the pharmacological treatment reported by Grant et al. (2004) and Grant and Grosz (2004) can be useful for benchmarking community pharmacological treatment of problem gambling. Kennedy et al. (2005) reports on the outcomes of inpatient treatment that can be used for benchmarking inpatient programs. The data provided by Shaffer et al. (2005) on a large group of patients over a significant period of time in a diverse geographic area can be pertinent for outpatient gambling treatment programs in the US, Canada, Australia, New Zealand and the UK. In addition, the documentation of a 36% abstinence rate among dropouts and referrals to their program substantiates the robust placebo response rates found in pharmacological studies (Rugle et al. 2001; Westphal and Abbott 2006) and some psychosocial studies (Echeburua and Fernandez-Montalvo 2005). The dose response effect found by Shaffer et al. (2005) could also illustrate a potential mechanism of treatment.

Impact of the Studies Published from 2003 to 2006

The evidence base for problem gambling treatment remains limited. The current status of the evidence base for problem gambling treatment is not sufficient to support the goal of providing effective treatment in the community. However, there has been improvement in the evidence base since 2003, including two adequately designed and well powered studies supporting cognitive behavioral treatment and nalmefene, an effectiveness study for cognitive behavioral treatment and publication of outcomes data for a large, geographically diverse outpatient treatment program, an inpatient program and outpatient pharmacological treatment. In addition, pilot data supporting further research on several new treatment approaches were published during that time period. Unfortunately, no treatment has made the transition from possibly efficacious to efficacious during this time period.

Future Studies to Develop Evidence Based Treatment

Westphal and Abbott (2006) published a pathway for developing effective problem gambling treatments. A key element of that pathway was replication studies for the possibly efficacious psychosocial and pharmacological treatments to establish at least one efficacious treatment that can be used as comparison treatment (Chambless and Ollendick 2001). Additional steps included clinical testing of psychosocial and pharmacological treatments used in combination, a series of effectiveness studies in diverse clinical settings and among diverse populations to determine how well the efficacious treatments work in the real world across cultures and jurisdictions and outcome studies from gambling treatment programs across jurisdictions and cultures to further assess community treatment.

Additional outcome and effectiveness studies are needed across jurisdictions and cultures to document the treatment provided and the effects of efficacious and possibly efficacious treatment on the diverse populations affected by problem gambling. However, the most important needed evidence remains replication studies of the possibly efficacious treatments.

Replication Studies

Although replication studies of both the possibly efficacious psychosocial and pharmacological treatments by independent investigators are needed, investment of time and money are usually necessary to for a treatment to make the transition to independent replication and/or multi-site studies. Pharmacological studies are usually easier to replicate especially if

the original studies were multi-site, such as, nalmefene (Grant et al. 2006) and naltrexone (Kim et al. 2001) because protocols for patient selection, treatment delivery and the quality control of treatment delivery have already been developed. Sustained release lithium for bipolar spectrum pathological gamblers (Hollander et al. 2005) was a single site study, so a protocol would need to be developed for multi-site replication. For regulatory approval of a medication for a disorder, usually several multi-site clinical trials are necessary. Since this level of investigation is expensive, the decision to invest in further clinical trials is usually an economic and market-driven decision by a pharmaceutical company sponsor.

The replication of psychosocial treatments by independent investigators or in multi-site studies usually requires the production of treatment manuals, training materials and therapeutic fidelity measures. Psychosocial treatments usually do not have sponsors to finance the investment required for the production of these materials. Fortunately, all of the possibly efficacious treatments currently have treatment manuals or materials available. Ladouceur has recently published a therapist manual and patient guidebook for the cognitive therapy developed by his group (Ladouceur and Lachance 2006a, b). Hodgins and Makarchuk (2003) published a patient workbook for the brief self-help intervention developed by his group. A replication study of brief intervention has been performed, but not published in a peer reviewed journal (Meyer and Dickow 2005).

The status of the cognitive behavioral treatment method is more complex, as significant variation can exist within that framework (Tavares et al. 2003; Walker 2005). There are two sets of treatment materials available for this method. Fernandez-Montalvo and Echeburua (1997) published a training manual for their cognitive behavioral treatment in Spanish and Petry (2005b) published a book that includes her treatment materials for the cognitive behavioral treatment used in her study (Petry et al. 2006). At least, some of the materials necessary for replication studies are currently available for all of the possibly efficacious psychosocial treatments.

Toneatto and Ladouceur (2003) cite measurement issues as one of the systemic difficulties for problem gambling treatment research. However, a framework for the reporting of outcomes in problem gambling treatment research has recently been published by a consensus of leading gambling researchers (Walker et al. 2006). The remaining major obstacles to the replication studies and the production of the needed evidence are funding and lack of collaboration among problem gambling treatment investigators (Westphal and Abbott 2006).

Discussion

Attrition

Two general themes emerge from the review of treatment studies published from 2003 through 2006, attrition and non-specific response to treatment. Data from two of the Level 4 outcome studies (Grant et al. 2004; Shaffer et al. 2005) highlight the importance of attrition. Shaffer et al. (2005) reported that only 17% of their large sample completed or substantially completed treatment. A recent review also found that gambling treatment of all types is associated with significant attrition (Westphal 2007). In a review of published gambling treatment studies from 1982 through 2005, Westphal (2007) found that attrition rates in short term pharmacological treatment studies ranged from 11.3 to 40% and in long term studies ranged from 48.3 to 59.4%. Psychosocial treatment studies ranged between 32 and 55.4% attrition. Community multimodal treatment studies ranged

between 29 and 83%, and Gamblers Anonymous studies ranged from 50 to 69.4% attrition.

These findings are important in the context of two different studies published between 2003 and 2006 (Shaffer et al. 2005; Petry et al. 2006) that found increasing amounts of treatment were associated with better outcomes and conversely, lower amounts of treatment were associated with poorer outcomes. The recommendations of Toneatto and Millar (2004) and Petry (2005a) to incorporate motivational enhancement into gambling treatment programs and the pilot work to develop treatment methods that improve compliance, such as, Milton et al. (2002) and Wulfert et al. (2006) are validated by this type of outcome data.

Non-specific Response to Treatment and Non-Equivalent Control Groups

Data from Saiz-Ruiz et al. (2005) and Shaffer et al. (2005) highlight the placebo or non-specific response to treatment by problem gamblers, evident in both pharmacological and psychosocial treatment. The Saiz-Ruiz et al. (2005) study reported a placebo response rate of 72% and Shaffer et al. (2005) reported 36% of early dropouts from treatment and referrals to treatment that did not start treatment were abstaining from gambling at the 6 month follow-up. The placebo or non-specific response can be conceptualized as the general response to treatment or treatment seeking with biological, psychological and social components (Hyland 2003). These reports of robust non-specific effects of treatment or treatment seeking are consistent with other reviews (Rugle et al. 2001; Westphal and Abbott 2006). Westphal and Abbott 2006 found the range of placebo response rates among pathological gamblers in pharmacological studies from 24 to 72% and the range of placebo response duration from 8 weeks to 6 months. The average rate of placebo response among pathological gamblers was 42%.

This robust non-specific response to treatment must be considered when evaluating treatment studies, especially studies with non-equivalent control groups (Djulbegovic et al. 2003; Westphal 2007; Westphal and Abbott 2006). Studies that are not blinded and do not have equivalent control groups are highly likely to overestimate treatment effects (Djulbegovic et al. 2003; Westphal 2007; Westphal and Abbott 2006) by including non-specific effects with the specific effects of treatment. Many gambling treatment studies including three of the Level 1 and 2 studies reviewed have non-equivalent, waiting list type controls.

For example, two recent reviews (Pallesen et al. 2005; Rogers 2006) provided quantitative meta-analysis of controlled trials of psychotherapeutic treatments of problem gambling but included studies with waiting list controls. The calculated effect sizes from these studies should be considered as upper limits for the treatment effects because of the large non-specific treatment effects found in gambling treatment studies were included in the measurement of the effect sizes of some of the studies.

Conclusions

The evidence base for problem gambling treatment remains limited. The current status of the evidence base is not sufficient to support the goal of maximizing effective treatments and minimizing ineffective treatments in the community. Three types of studies are needed: (1) replication studies of the possibly efficacious treatments by independent investigators and (2) effectiveness studies of the possibly efficacious treatments in community settings provided by community clinicians and (3) outcome studies of community gambling treatment provided across cultures and jurisdictions.

References

Abbott, M. W., Volberg, R. A., Bellringer, M., & Reith, G. (2004). *A review of research on aspects of problem gambling: Final report*. Auckland, NZ: Gambling Research Centre, Auckland University of Technology.

Antman, E. M., Lau, J., Kupelnick, B., Mosteller, F., & Chalmers, T. C. (1992). A comparison of results of meta-analyses of randomized control trials and recommendations of experts. *Journal of the American Medical Association, 268*, 240–248.

Blaszczynski, A., & Silove, D. (1995). Cognitive and behavioral therapies of pathological gambling. *Journal of Gambling Studies, 11*, 195–219.

Carey, T. S., & Boden, S. D. (2003). A critical guide to case series reports. *Spine, 28*(15), 1631–1634.

Chambless, D. L., & Ollendick, T. H. (2001). Empirically supported psychological interventions: Controversies and evidence. *Annual Review of Psychology, 52*, 685–716.

Coleman, P., & Nicholl, J. (2001). Influence of evidence-based guidance on health policy and clinical practice in England. *Quality in Health Care, 10*(4), 229–237.

Czuchry, M., & Dansereau, D. F. (1999). Node-link mapping and psychological problems. Perceptions of a residential drug abuse treatment program for probationers. *Journal of Substance Abuse Treatment, 17*(4), 321–329.

Dannon, P. N., Lowengrub, K., Gonopolski, Y., Musin, E., & Kotler, M. (2005). Topiramate versus fluvoxamine in the treatment of pathological gambling: A randomized, blind-rater comparison study. *Clinical Neuropharmacology, 28*(1), 6–10.

Davidson, K. W., Goldstein, M., Kaplan, R. M., Kaufmann, P. G., Knatterud, G. L., Orleans, C. T. et al. (2003). Evidence-based behavioral medicine: What is it and how do we achieve it? *Annuals of Behavioral Medicine, 26*(3), 161–171.

Djulbegovic, B., Cantor, A., & Clarke, M. (2003). The importance of preservation of the ethical principle of equipoise in the design of clinical trials: Relative impact of the methodological quality domains on the treatment effect in randomized controlled trials. *Accountability in Research, 10*(4), 301–315.

Doig, G. S., & Simpson, F. (2003). Efficient literature searching: A core skill for the practice of evidence based medicine. *Intensive Care Medicine, 29*(12), 2119–2127 (Epub 3 September 2003).

Dowling, N., Smith, D., & Thomas, T. (2006). Treatment of female pathological gambling: The efficacy of a cognitive–behavioural approach. *Journal of Gambling Studies, 22*(4), 355–372.

Echeburua, E., Baez, C., & Fernandez-Montalvo, J. (1996). Comparative effectiveness of three therapeutic modalities in the psychological treatment of pathological gambling. *Behavioral and Cognitive Psychotherapy, 24*, 51–72.

Echeburua, E., & Fernandez-Montalvo, J. (2005). Psychological treatment of slot-machine pathological gambling: New perspectives. *Journal of Gambling Studies, 21*(1), 21–26.

Fernandez-Montalvo, J., & Echeburua, E. (1997). *Manual del juego patológico. Ayuda para el paciente y guía para el terapeuta*. Madrid, Spain: Pirámide.

Food and Drug Administration. (2005). *From test tube to patient*. FDA Consumer Magazine, http://www.fda.gov/fdac/special/testtubetopatient/drugreview.html, accessed on 10/17/06.

Glanville, J. M., Lefebvre, C., Miles, J. N., & Camosso-Stefinovic, J. (2006). How to identify randomized controlled trials in MEDLINE: Ten years on. *Journal of the Medical Library Association, 94*(2), 130–136.

Grant, J. E., & Grosz, R. (2004). Pharmacotherapy outcome in older pathological gamblers: A preliminary investigation. *Journal of Geriatric Psychiatry and Neurology, 17*(1), 9–12.

Grant, J. E., Kim, S. W., & Kuskowski, M. (2004). Retrospective review of treatment retention in pathological gambling. *Comprehensive Psychiatry, 45*(2), 83–87.

Grant, J. E., Potenza, M. N., Hollander, E., Cunningham-Williams, R., Numinen, T., Smits, G. et al. (2006). Multicenter investigation of the opioid antagonist nalmefene in the treatment of pathological gambling. *American Journal of Psychiatry, 163*(2), 303–312.

Grimes, D. A., & Schulz, K. F. (2002a). An overview of clinical research: The lay of the land. *Lancet, 359* (9300), 57–61.

Grimes, D. A., & Schulz, K. F. (2002b). Descriptive studies: What they can and cannot do. *Lancet, 359* (9301), 145–149.

Harbour, R., & Miller, J. (2001). A new system for grading recommendations in evidence based guidelines. *British Medical Journal, 323*, 334–336.

Haynes, B., & Haines, A. (1998). Barriers and bridges to evidence based clinical practice. *British Medical Journal, 317*(7153), 273–276.

Hodgins, D. C., Currie, S. R., & el-Guebaly, N. (2001). Motivational enhancement and self-help treatments for problem gambling. *Journal of Consulting and Clinical Psychology, 69*(1), 50–57.

Hodgins, D. C., & Makarchuk, K. (2003). *Becoming a winner: Defeating problem gambling, a gambling self help manual*. Calgary, Alberta, Canada: University of Calgary.

Hoffman, J. R. (1999). Rethinking case reports. *Western Journal of Medicine, 170*(5), 253–254.

Hollander, E., Pallanti, S., Allen, A., Sood, E., & Baldini Rossi, N. (2005). Does sustained-release lithium reduce impulsive gambling and affective instability versus placebo in pathological gamblers with bipolar spectrum disorders? *American Journal of Psychiatry, 162*(1), 137–145.

Huber, A., Lord, R. H., Gulati, V., Marinelli-Casey, P., Rawson, R., & Ling, W. (2000). The CSAT methamphetamine treatment program: Research design accommodations for "real world" application. *Journal of Psychoactive Drugs, 32*(2), 149–156.

Hunsley, J., Dobson, K. S., Johnston, C., & Mikail, S. F. (1999). Empirically supported treatments in psychology: Implications for Canadian professional psychology. *Canadian Psychology, 40*, 289–302.

Hyland, M. E. (2003). Using the placebo response in clinical practice. *Clinical Medicine, 3*(4), 347–350.

Kennedy, C. H., Cook, J. H., Poole, D. R., Brunson, C. L., & Jones, D. E. (2005) Review of the first year of an overseas military gambling treatment program. *Military Medicine, 170*(8), 683–687.

Kennedy, K. A., & Frankowski, R. F. (2003). Evaluating the evidence about therapies. What the clinician needs to know about statistics. *Clinical Perinatology, 30*(2), 205–215.

Kim, S. W., Grant, J. E., Adson, D. E., & Shin, Y. C. (2001). Double-blind naltrexone and placebo comparison study in the treatment of pathological gambling. *Biological Psychiatry, 49*(11), 914–921.

Kim, S. W., Grant, J. E., Elke, D. E., Farris, P. L., & Hartman, B. K. (2006) Pathological gambling and mood disorders: Clinical associations and treatment implications. *Journal of Affective Disorders, 92*(1), 109–116. Epub 2006 Jan 27.

Ladouceur, R., & Lachance, S. (2006a). *Overcoming your pathological gambling therapist guide*. Oxford, UK: Oxford University Press.

Ladouceur, R., & Lachance, S. (2006b). *Overcoming your pathological gambling workbook*. Oxford, UK: Oxford University Press.

Ladouceur, R., Sylvain, C., Boutin, C., Lachance, S., Doucet, C., Leblond, J. et al. (2001). Cognitive treatment of pathological gambling. *Journal of Nervous and Mental Disease, 189*(11), 774–780.

Lefebvre, C. (1994). The Cochrane Collaboration: The role of the UK Cochrane Centre in identifying the evidence. *Health Libraries Review, 11*(4), 235–242.

Lopez Viets, V. C., & Miller, W. R. (1997). Treatment approaches for pathological gamblers. *Clinical Psychology Review, 17*(7), 689–702.

Lydiard, R. B., Perera, P., Batzar, E., & Clary, C. M. (1999). From the bench to the trench: A comparison of sertraline treatment of major depression in clinical and research patient samples. *Primary Care Companion: Journal of Clinical Psychiatry, 1*(5), 154–162.

Mair, F., Crowley, T., & Bundred, P. (1996). Prevalence, aetiology and management of heart failure in general practice. *British Journal of General Practice, 46*, 77–79.

March, J. S., Silva, S. G., Compton, S., Shapiro, M., Califf, R., & Krishnan, R. (2005). The case for practical clinical trials in psychiatry. *American Journal of Psychiatry, 162*(5), 836–846.

Mashru, M., & Lant, A. (1997). Interpractice audit of diagnosis and management of hypertension in primary care: Educational intervention and review of medical records. *British Medical Journal, 314*, 942–946.

Mattson, M. E., & Donovan, D. M. (1994a). Clinical applications: The transition from research to practice. *Journal of Studies on Alcohol. Supplement, 12*, 163–166.

Mattson, M. E., & Donovan, D. M. (1994b). Alcoholism treatment matching research: Methodological and clinical issues. *Journal of Studies on Alcohol. Supplement, 12*, 5–14.

Melville, C. L., Davis, C. S., Matzenbacher, D. L., &, Clayborne, J. (2004). Node-link-mapping-enhanced group treatment for pathological gambling. *Addictive Behavior, 29*(1), 73–87.

Meyer, G., & Dickow, B. (2005). *Minimale Intervention bei problematischem Spielverhalten an Unterhaltungsautomaten mit Geld-Gewinnmöglichkeiten*. Abschlussbericht an den Arbeitsausschuss Münzautomaten (AMA). Fachbereich 11, Universität Bremen: Bremen.

Milton, S., Crino, R., Hunt, C., & Prosser, E. (2002). The effect of compliance-improving interventions on the cognitive–behavioural treatment of pathological gambling. *Journal of Gambling Studies, 18*(2), 207–229.

Mulder, R. T., Frampton, C., Joyce, P. R., & Porter, R. (2003). Randomized controlled trials in psychiatry. Part II: Their relationship to clinical practice. *Australian New Zealand Journal of Psychiatry, 37*(3), 265–269.

Oakley-Browne, M. A., Adams, P., & Mobberley, P. M. (2004). Interventions for pathological gambling (Cochrane Review). In The Cochrane Collaboration (Eds.), *The Cochrane Library*, *Issue 1*. Chichester, UK: Wiley.

Pallesen, S., Mitsem, M., Kvale, G., Johnsen, B. H., & Molde, H. (2005). Outcome of psychological treatments of pathological gambling: A review and meta-analysis. *Addiction, 100*(10), 1412–1422.

Parry, G. (1996). *NHS psychotherapy services in England*, Rep. 96PP0043. London: Department of Health.

Petry, N. M. (2005a). Stages of change in treatment-seeking pathological gamblers. *Journal of Consulting and Clinical Psychology, 73*(2), 312–322.

Petry, N. M. (2005b). *Pathological gambling: Etiology, comorbidity and treatment*. Washington, DC: American Psychological Association.

Petry, N. M., Ammerman, Y., Bohl, J., Doersch, A., Gay, H., Kadden, R. et al. (2006). Cognitive–behavioral therapy for pathological gamblers. *Journal of Consulting and Clinical Psychology, 74*(3), 555–567.

Pitre, U., Dansereau, D. F., Newbern, D., & Simpson, D. D. (1998). Residential drug abuse treatment for probationers. Use of node-link mapping to enhance participation and progress. *Journal of Substance Abuse Treatment, 15*(6), 535–543.

Rawson, R. A., Marinelli-Casey, P., Anglin, M. D., Dickow, A., Frazier, Y., Gallagher, C. et al. (2004). A multi-site comparison of psychosocial approaches for the treatment of methamphetamine dependence. *Addiction, 99*(6), 708–717.

Reeves, B. C. (2004). Reasons for caution when evaluating health care interventions using non-randomised study designs. *Forsch Komplementarmed Klass Naturheilkd, 11*(Suppl 1), 40–45.

Rogers, R. D. (2006). Review: Psychological treatments improve pathological gambling in the short and long term. *Evidence Based Mental Health, 9*(2), 44.

Roth, A. D., & Fonagy, P. (1996). *What works for whom? A critical review of psychotherapy research*. New York: Guilford.

Rugle, L. J., Derevensky, J., Gupta, R., Winters, K. C., & Stinchfield, R. (2001). *The treatment of pathological gambling*. Washington, DC: Center for Mental Health Services, Substance Abuse and Mental Health Services Administration.

Rychtarik, R. G., & McGillicuddy, N. B. (2006). Preliminary evaluation of a coping skills training program for those with a pathological-gambling partner. *Journal of Gambling Studies, 22*, 165–178.

Sackett, D. L., Richarson, W. S., Rosenberg, W., & Haynes, R. B. (1998). *Evidence based medicine how to practice and teach EBM*. Edinburgh, Scotland: Livingstone.

Sackett, D. L., Rosenberg, W. M. C., Gray, J. A. M., & Haynes, R. B. (1996). Evidence based medicine: What it is and what it isn't. *British Medical Journal, 312*, 71–72.

Saiz-Ruiz, J., Blanco, C., Ibanez, A., Masramon, X., Gomez, M. M., Madrigal, M. et al. (2005). Sertraline treatment of pathological gambling: A pilot study. *Journal of Clinical Psychiatry, 66*(1), 28–33.

Shaffer, H. J., LaBrie, R. A., LaPlante, D. A., Kidman, R. C., & Donato, A. N. (2005). The Iowa gambling treatment program: Treatment outcomes for a follow-up sample. *Journal of Gambling Studies, 21*(1), 59–71.

Sibbald, B., & Roland, M. (1998). Understanding controlled trials. Why are randomized controlled trials important? *British Medical Journal, 316*(7126), 201.

Srisurapanont, M., & Jarusuraisin, N. (2005). Opioid antagonists for alcohol dependence. *Cochrane Database Systemic Reviews*, (1), CD001867.

Stinchfield, R., & Winters, K. C. (2001). Outcome of Minnesota's gambling treatment programs. *Journal of Gambling Studies, 17*(3), 217–245.

Strauss, B. M., & Kaechele, H. (1998). The writing on the wall: Comments on the current discussion about empirically validated treatments in Germany. *Psychotherapy Research, 8*, 158–177.

Sudlow, M., Rodgers, H., Kenny, R., & Thomson, R. (1997). Population based study of use of anticoagulants among patients with atrial fibrillation in the community. *British Medical Journal, 314*, 1529–1530.

Task Force Promoting Dissemination of Psychological Procedures. (1995). Training in and dissemination of empirically-validated psychological treatments: Report and recommendations. *Clinical Psychology, 48* (1), 3–23.

Tavares, H., Zilberman, M. L., & el-Guebaly, N. (2003) Are there cognitive and behavioural approaches specific to the treatment of pathological gambling? *Canadian Journal of Psychiatry, 48*(1), 22–27.

Toneatto, T., & Ladouceur, R. (2003). Treatment of pathological gambling: A critical review of the literature. *Psychology of Addictive Behaviors, 42*, 92–99.

Toneatto, T., & Millar, G. (2004). Assessing and treating problem gambling: Empirical status and promising trends. *Canadian Journal of Psychiatry, 49*(8), 517–525.

Vandenbroucke, J. P. (2001). In defense of case reports and case series. *Annuals of Internal Medicine, 134*(4), 330–334.

Walker, M. B. (1992). *The psychology of gambling*. Oxford, UK: Pergamon.

Walker, M. B. (2005). Problems in measuring the effectiveness of cognitive therapy for pathological gambling. *Journal of Gambling Studies, 21*(1), 79–90.

Walker, M., Toneatto, T., Potenza, M. N., Petry, N., Ladouceur, R., Hodgins, D. C. et al. (2006). A framework for reporting outcomes in problem gambling treatment research: The Banff, Alberta Consensus. *Addiction, 101*(4), 504–511.

Westphal, J. R. (2007). Are the effects of gambling treatment overestimated? *International Journal of Mental Health and Addiction, 5*(1), 65–79.

Westphal, J., & Abbott, M. (2006) Models for multi-site problem gambling clinical trials. *International Gambling Studies, 6*(2), 129–145.

Woolf, S. H. (2000). Evidence-based medicine and practice guidelines: An overview. *Cancer Control, 7*(4), 362–367.

Wulfert, E., Blanchard, E. B., Freidenberg, B. M., & Martell, R. S. (2006). Retaining pathological gamblers in cognitive behavior therapy through motivational enhancement: A pilot study. *Behavior Modification, 30*(3), 315–340.

Zarin, D. A., Young, J. L., & West, J. C. (2005). Challenges to evidence-based medicine: A comparison of patients and treatments in randomized controlled trials with patients and treatments in a practice research network. *Social Psychiatry and Psychiatric Epidemiology, 40*(1), 27–35.