

Is There a Case for Extended Interventions for Alcohol and Drug Use Disorders?

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Short Title: Extended Interventions

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In Press, *Addiction*

## Is There a Case for Extended Interventions for Alcohol and Drug Use Disorders?

### Abstract

**Aims** To determine whether there is evidence to support the implementation of extended interventions (i.e., longer than 6 months) for individuals with alcohol or other drug use disorders.

**Methods** Literature on extended behavioral and pharmacotherapy interventions was reviewed, along with findings from studies of extended monitoring and monitoring paired with adjunctive counseling. Studies were identified through data base searches, citations in prior reviews, and examinations of recent volumes of relevant journals. Key terms were defined, and a theoretical rationale was presented for extended treatment. Several adaptive treatment studies that made use of stepped care or continuation protocols were also described.

**Measurements** The primary outcomes that were considered were alcohol and drug use during the intervention and post-intervention follow-ups. Other outcomes were examined when they were included in the articles reviewed.

**Findings** Most of the studies in the review provided support for the effectiveness of extended interventions for alcohol and drug abusers, whether the extended care was delivered through face-to-face contact or at a distance via the telephone. These findings held across all types of interventions that were examined (e.g., behavioral treatment, pharmacotherapy, and monitoring). However, only a few studies directly compared extended and standard length version of the same intervention. New developments in addiction treatment with implications for extended care models were also described and discussed.

**Conclusions** The findings of the review indicate that maintaining therapeutic contact for extended periods of time with individuals with alcohol and other drug disorders appears to promote better long-term outcomes than “treatment as usual,” although more studies are needed that compare extended and standard versions of interventions. Achieving good compliance and success-

ful disease management with extended interventions will likely require adaptive protocols in which the intensity of treatment can be adjusted up or down in response to changes in symptoms and functioning over time. Future directions in research on extended interventions were discussed.

**Key Words** substance use disorders, addiction management, extended interventions, adaptive protocols, continuing care

### Introduction

Although the field of addiction treatment has certainly had its share of controversies, there is—and has always been—considerable agreement that for many afflicted individuals, addiction is clearly not an “acute” disorder (McLellan, Lewis, O’Brien, & Kleber 2000; Scott, Dennis, & Foos in press). Rather, addictions tend to develop over time, and periods of problematic use and related impairments often occur for many years after criteria for dependence or abuse have been reached (Vaillant 2003). Moreover, it is often not clear when an addiction is permanently resolved. At times, the chronic nature of these disorders can be obscured by a tendency in some individuals to manifest fairly pronounced reductions in symptom severity for significant periods. For example, periods of abstinence or unproblematic use between periods of heavy use are not uncommon, even in individuals with a history of substance dependence (Anglin, Hser, & Grella 1997; McKay & Weiss 2001; Vaillant 2003).

Several approaches to the treatment of addictions have been developed specifically to address the chronic nature of these disorders. Alcoholics Anonymous and other self/mutual help programs assert that recovery is a lifetime process, and urge their members to deal with their addictions “one day at a time” and remain active in these programs for considerable periods (Humphreys 2003). For opiate addicts, methadone maintenance has also generally been seen as a long-term treatment, designed to maintain patients in a more stable and functional state, rather than to cure them (Ball & Ross 1991). Proponents of mutual help programs and methadone maintenance strongly believe that most substance abusers will do well only as long as they participate actively in these programs, and data tend to support this assertion (Moos & Moos 2004; Sees et al. 2000; Tonigan, Toscova, & Miller 1996). Advocates of therapeutic communities and other long-term residential programs also take the position that some addicts require extended treatment (De Leon 1996; De Leon, Hawke, Jainchill, & Melnick 2000).

Conversely, other approaches to the treatment of addiction have tended to be relatively brief, and have in fact been getting shorter over the last decade, largely due to guidelines set by insurance companies and managed care. These programs usually recommend some form of continuing care, but even this phase of treatment is often relatively brief, and not always available. At this point most addiction treatment in the U.S. is provided in outpatient programs, where the planned duration of care is usually 90 days or less and actual length of stay is often less than 30 days (McLellan, Carise, & Kleber 2003; SAMHSA 2002). After patients complete or drop out of treatment, there are generally no provisions to manage their disorders through ongoing monitoring or “check-ups,” which are common with other chronic disorders (McLellan et al. 2000). Eventually, many individuals with substance use disorders end up with “treatment careers” that consist of a number of relatively short treatment episodes over time (Hser, Anglin, Grella, Longshore, & Predergast 1997), but these episodes are typically not integrated in any way.

The apparent mismatch between the chronic nature of addictions and the duration of the treatments most often provided to ameliorate them has been noted in a number of recent publications (Dennis, Scott, & Funk 2003; Humphreys & Tucker 2002; McKay 2001; McLellan et al. 2000; Stout, Rubin, Zwick, Zywiak, & Bellino 1999). One obvious approach to addressing this mismatch is to routinely provide longer interventions to individuals with substance use disorders. In this regard, extended treatment protocols are becoming increasingly common in a number of chronic disorders, including depression (Jarrett et al. 2001; Rush et al. 1998), diabetes (Look Ahead Research Group 2003), hypertension (Whelton et al. 1998), and obesity (Berkowitz, Wadden, Tershakovec, & Cronquist 2003). In addictions treatment research, protocols of up to six months in length are not unusual (Crits-Christoph et al. 1999; Higgins et al. 2003; McKay et al. 1999; Milby et al. 1996; Kadden, Cooney, Getter, & Litt, 1989). However, relatively few studies have evaluated interventions with planned durations of more than six months.

The purpose of this article is to review the evidence for the feasibility and effectiveness of extended interventions for alcohol and drug use disorders. First, a definition of what constitutes an “extended intervention” is provided, along with a discussion of related terms, such as “continuing care.” Second, a theoretical rationale for extended interventions is presented. Third, studies that have evaluated extended behavioral or pharmacological interventions are described and findings presented. Fourth, new developments in the design and evaluation of treatments that have important implications for improving the feasibility and effectiveness of extended interventions are presented. This section highlights adaptive protocols, which provide specific guidelines for changing interventions in response to changes in patients’ symptoms and level of functioning over time. Finally, recommendations for moving the addiction treatment service delivery system toward a disease management approach are proposed, and a number of important issues that require further research are highlighted.

Before proceeding, comments on two issues are in order. The first concerns who is likely to be an appropriate candidate for extended interventions. Research has clearly shown that many individuals with substance use disorders recover without formal treatment (Sobell, Sobell, Tonneatto, & Leo 1993), and that others obtain durable improvements following brief interventions such as Motivational Interviewing (Babor & Grant 1992; Bien et al. 1993; Dunn, Deroo, & Rivara 2001; Miller & Rollnick 1991; Moyer, Finney, Swearingen, & Vergun 2002). Therefore, extended interventions may be most appropriate for people with substance use disorders who have not been able to achieve clinically significant, sustained reductions in alcohol or drug use on their own or following brief interventions (Humphreys & Tucker 2002).

The second issue concerns what kinds of “interventions” might be considered as potential therapeutic components of extended care models in the addictions. A central theme that is revisited at several point in this article is that extended interventions for substance use disorders will likely have to make use of a variety of therapeutic components and modalities, ranging from in-

patient treatment to periodic monitoring via telephone or internet. Therefore, any type of intervention that promotes sustained contact between the treatment system and patients can be considered as a viable therapeutic agent, regardless of whether it involves traditional face-to-face contact or telephone monitoring calls made to a computerized Interactive Voice Response (IVR) system.

### Definitions

For the purposes of this review, “extended interventions” are defined as therapeutic protocols that have a planned duration of longer than 6 months. This definition was chosen to highlight treatments that are longer than the interventions that are typically provided in most public or private treatment programs or evaluated in research studies. However, many extended interventions included in this review have a planned duration of at least a year.

At this point, there are a number of terms in the addiction treatment field that imply or are in some way associated with the concept of extended interventions. These include “aftercare,” “step-down care,” “stepped care,” “continuum of care,” “continuing care,” and “disease management.” All but the latter of these terms refer to the dividing of treatment interventions into phases, which differ with regard to frequency or intensity. For example, aftercare and step-down care refer to treatments of relatively brief durations that are provided after an initial, more intensive treatment phase, such as residential care or intensive outpatient treatment. Continuing care has also been used to denote treatment beyond the initial phase of care, but in some cases it has implied longer-term treatments. Conversely, stepped care and continuum of care refer to entire treatment protocols or systems in which patients can be moved between various intensities of care, as their symptoms improve or worsen. However, it is possible for any of these terms to apply to interventions that are less than 6 months in total planned duration; therefore they do not necessarily denote “extended” interventions, at least as that term is defined here. Although not

completely synonymous with extended interventions, the term “disease management” has a similar meaning in that it implies the use of long-term interventions, or at least protracted therapeutic contact of one sort or another, in the service of managing addiction over time.

### Rationale for Extended Interventions

The continued vulnerability to relapse exhibited by many treatment seeking substance abusers appears to be a function of poor compliance with treatment and continuing care, as well as other factors, including stress, craving, low motivation, poor self-efficacy, lack of social support, failure to sustain participation in self-help groups and other pro-recovery activities, co-occurring psychiatric disorders, and living in neighborhoods with high levels of crime and drug abuse (Connors, Maisto, & Zywiak 1996; Hall, Havassy, & Wasserman 1991; Hser, Grella, Hsieh, Anglin, & Brown 1999; Longabaugh, Wirtz, Beattie, Noel, & Stout 1995; McKay, Merikle, Mulvaney, Weiss, & Koppenhaver 2001; McLellan et al. 2000; Miller, Westerberg, Harris, & Tonigan 1996; Moos, Finney, & Cronkite 1990; Morgenstern, Labouvie, McCrady, Kahler, & Frey 1997; Simpson 2004; Tonigan et al. 1996). With regard to biological factors, genetic vulnerability, negative mood states, disturbed sleep architecture, cognitive impairments, and protracted alterations in biological stress responses have been associated with poor drinking outcomes (Koob 2000; Meyers 2001).

These findings may explain why initial and continuing care treatments derived from an acute care model are of limited effectiveness in the long-term management of drug dependence. Specifically, vulnerability to relapse remains relatively high for significant periods of time after standard treatment protocols of three to six months have ended (Dennis et al. 2003; McLellan et al., 2000). Better management requires longer periods of continued contact with the patient (McLellan, McKay, Forman, Cacciola, & Kemp 2005; Wagner et al., 2001), in order to address flagging motivation, increased craving, poor compliance with lifestyle changes and self/mutual

help participation, continued biological vulnerability to stress and other factors, and various other problems that arise over time. In addition, the regular recording of symptom severity and behaviors, which is provided by extended interventions, appears to have a beneficial effect on health outcomes (Bandura 1991; Febraro & Clum 1998), possibly because it serves as a prompt to maintain behavior change efforts.

Another argument that has been made to support extended interventions is consistent findings in treatment research studies is that longer retention is associated with better outcomes (Simpson 2004). However, this relationship could be accounted for by any number of factors outside of treatment, including patient motivation and initial success in achieving abstinence. There have been a number of controlled studies that have directly compared shorter versus longer versions of the same or similar treatment (Kamara & Van Der Hyde 1997; Long et al. 1998; McCusker et al. 1995; Miller & Hester 1986; Stephens, Roffman, & Curtin, 2000; Trent 1998). In virtually all of these studies, treatments with longer planned durations have not produced better substance use outcomes than those with shorter durations. However, the treatments that have been compared in these studies are for the most part relatively short, with the “long” condition rarely exceeding 90 days. Therefore, these studies have not directly examined whether extended interventions produce better outcomes than standard length (i.e., 90 day) treatments.

#### Literature Search Methods

The studies that are reviewed in this section were identified through several sources. Literature searches with Medline and PsychInfo were performed using various combinations of key words such as “extended treatment,” “extended outpatient treatment,” “extended inpatient or residential treatment,” “long treatment,” “continuing care,” “addiction management,” and “therapeutic community,” along with “controlled trial or study.” Initial searches were also done which specified various lengths of treatment (e.g., 12 months, 18 months, 24 months). Data

bases assembled by other investigators for meta-analyses of the alcohol (John Finney), drug (Michael Prendergast), and criminal justice (Frank Pearson) treatment literatures were also searched for studies of treatment interventions that were greater than six months in length. Finally, the tables of contents of a number of journals were manually searched for appropriate articles (e.g., *Journal of Consulting and Clinical Psychology*, *Addiction*, *Journal of Studies on Alcohol*, *Journal of Substance Abuse Treatment*, *Archives of General Psychiatry*). The review was limited primarily to controlled studies, although in a few cases novel studies that were not controlled were included.

It should be noted that there are relatively few studies of extended interventions in the addictions, and those that were identified varied considerably with regard to the nature of interventions tested and designs employed. In most cases, the studies were not designed to specifically test standard vs. extended versions of the same interventions. This unfortunately precluded the use of more contemporary and rigorous approaches to systematic review, such as meta-analysis. Several studies that are either in progress or for which final results have not been published are also presented, to provide a fuller picture of work in the area of extended care. Despite these limitations, it is hoped that this review and discussion will move the treatment field forward by taking stock of what is known to date about the feasibility and effectiveness of longer-term interventions for substance use disorders.

#### Approaches to Extended Interventions

Although studies of extended interventions are relatively rare, they can be found in the literature. These studies fall roughly into two categories. The first involves efforts to take behavioral or pharmacological treatments and provide them over periods of greater than six months. The interventions in these studies all involved face-to-face contact with counselors or therapists, and in most cases were provided in clinics and other treatment facilities. The second

category is lower intensity interventions that involve regular monitoring of patients' symptoms and status over extended periods of time. In some studies the monitoring has been accomplished through face-to-face contacts with research or treatment personnel, whereas in others, it has been done through telephone contacts. Some of the monitoring protocols have also included attempts to link patients to services when warranted, or have provided brief counseling as part of the contacts.

### Treatment Interventions

Long-term behavioral interventions. Several studies have examined behavioral treatments of six months to a year's duration or longer, intended to both initiate and sustain abstinence, that were provided in treatment facilities. Ojehagen et al. (1992) conducted a 2 x 2 study in socially stable alcoholic patients that compared psychodynamic vs. behavior therapy, both delivered in 1 vs. 2 year protocols. Participants in each of the four conditions were scheduled for up to 30 sessions, which were spaced more widely in the 2-year versions of the treatments. Results suggested that the 1-year versions of the treatments had better outcomes during the first year after randomization, but there were no differences between therapy types or durations by the third year of the follow-up. Moreover, the number of therapy sessions received was not related to alcohol use outcomes. However, the study had a small sample size (N=72), and the behavior therapy conditions were delivered by only one therapist.

Two 12 month therapeutic community treatments were compared in a randomized study by Nemes, Wish, and Messina (1999). One of the conditions provided 10 months of inpatient care followed by 2 months of outpatient services, whereas the other condition featured a 6 month inpatient phase followed by 6 months of outpatient care. Ninety-three percent of the original sample of 412 patients were interviewed at the follow-up, which was approximately 3 years post intake. The condition that included 10 months of inpatient care produced higher rates of employment, less opiate use, and better criminal justice outcomes at a follow-up than the compari-

son condition. Using a propensity score procedure in a sample of 449 adolescent probationers, Morral et al. (2004) compared outcomes of those who were treated in the Phoenix Academy model, a therapeutic community with a 9-12 month planned length of stay, to outcomes of similar adolescents who received alternative probation dispositions. The results indicated that Phoenix Academy residents had better drug use and psychiatric symptom outcomes over the one-year follow-up than those in the comparison condition.

Braukmann et al. (1985) compared two community-based, group-home models for the treatment of 185 delinquent youth with substance abuse problems, using a nonrandomized design. The Teaching-Family homes were all directed by married couples, who received extensive training and supervision in the application of the components of the model. The comparison homes also provided treatment, but it was not standardized and the majority was delivered by clinicians who did not live in the house. The average length of stay in the homes that used the Teaching-Family approach was 289 days, whereas the length of stay in the comparison homes was 185 days. Outcome analyses focused on average substance use and prosocial behavior while the participants were still living in the group homes. Youth in the Teaching-Family homes had less alcohol use and more prosocial behavior than those in the comparison houses. However, length and type of treatment were confounded, making interpretation of the results difficult.

A random assignment study by Dahlgren and Willander (1989) compared a specialized women's unit with an average stay of over eight months to a standard mixed gender treatment facility with an average stay of five months in a sample of 200 women alcoholics in Sweden. Thirty-six percent of the women in the specialized unit remained in treatment for over 12 months, as compared to 21% of those in the standard facility. Two-year outcomes indicated lower alcohol consumption and better social adjustment for those in the specialized women's unit. However, once again length and type of treatment are totally confounded. Another study done in Sweden (Tomson, Romelsjo, & Aberg 1998) randomly assigned 222 "excessive drink-

ers” recruited at a health screening to a condition that featured three sessions with a nurse over a 12 month period or to one visit with a general practitioner. At the two-year follow-up, the experimental condition had significant decreases in GGT levels from baseline, signifying improvements in heavy alcohol consumption, whereas the control condition had an increase in GGT.

Silverman and colleagues studied the impact of two 12 month behavioral augmentations to standard care for methadone maintenance patients who continued to use cocaine regularly during their first 10 weeks on methadone maintenance (Silverman, Robles, Mudric, Bigelow, Stitzer 2004). Both conditions involved reinforcing cocaine and opiate free urine samples by providing take-home methadone doses or the combination of take-home methadone doses and vouchers totaling as much as \$5,800, which could be redeemed for goods and services consistent with a pro-recovery lifestyle. Both conditions increased cocaine abstinence during the intervention period, compared to the methadone treatment as usual control condition, with the largest and most sustained abstinence in the voucher reinforcement condition. Furthermore, the positive effects in the voucher condition persisted during a 9-week post-intervention period.

In another study of extended treatment, Silverman and colleagues (2002) evaluated the impact of a long-term, therapeutic workplace in a sample of 40 unemployed, heroin- and cocaine-dependent young mothers on methadone maintenance. The intervention featured the opportunity of full-time employment as a data entry clerk, and reinforcement was provided for abstinence, attendance, punctuality, professional demeanor, and learning/productivity. The comparison condition was usual care only (i.e., methadone maintenance). Of the 20 women randomized to the therapeutic workplace condition, half maintained steady employment for the majority of 36 months. The numbers of cocaine- and opiate-negative urines across the entire 36 month follow-up were significantly higher in the therapeutic workplace condition than in the comparison condition.

Continuing care interventions. Three controlled studies have contrasted continuing care treatments that were provided for a year with “treatment as usual” control conditions. One of these studies tested a protocol that consisted of home visits provided by a nurse over a 12 month period in alcohol dependent patients who had completed a six-week inpatient program (Patterson, MacPherson, & Brady 1997). These visits were weekly for the first six weeks post discharge, and were monthly thereafter. Participants in the control condition were offered standard continuing care, which consisted of review appointments at the inpatient program every 6 weeks. Data collected at 1- and 5-year follow-ups indicated that 36% of the extended treatment condition maintained complete abstinence over the 5 year follow-up, compared to 6% of the control condition. Outcomes on other measures, including blackouts and gambling, also favored extended treatment over the control condition (Patterson et al. 1997).

A second study compared an extended follow-up procedure that provided up to 30 contacts over a one year period to standard follow-up procedures in EAP participants who had completed an episode of substance abuse treatment and returned to work (Foote & Erfurt 1991). The EAP counselor was located at the workplace, and participants in the experimental condition received an average of 15 contacts over a year period, including 7 visits and 3 telephone calls, compared to an average of 3 contacts for those in the control condition. These contacts were designed to reinforce motivation, address difficulties that had emerged, and arrange for additional care if warranted. Although the planned schedule of contacts was weekly for one month, monthly for the next five months, and bi-monthly after that, the contact schedule reverted to once per week in the case of relapse or threat of relapse. Six outcomes were examined: absenteeism, substance abuse and other disability costs, substance abuse treatment costs, other treatment costs, and substance abuse hospitalizations. The experimental condition produced better outcomes than the standard follow-up procedure on substance abuse treatment costs and hospitalizations. However, substance use outcomes were not assessed in this study.

O'Farrell and colleagues tested the impact of 15 additional behavioral marital relapse prevention sessions delivered over a year period for couples who had previously received weekly behavioral marital therapy (BMT) for 5-6 months (O'Farrell, Choquette, & Cutter 1998). Results from this randomized study indicated that compared to no further treatment, the extended BMT relapse prevention sessions produced better drinking outcomes out to 18 months and better marital adjustment out to 30 months. This study was particularly strong from a methodological standpoint, with state-of-the-art monitoring of adherence to the treatment manuals, frequent follow-ups and a high follow-up rate, and independent confirmation of alcohol use outcomes.

Finally, the effect of up to 5 couples therapy booster sessions provided over a 12 month period was evaluated in a study that compared three forms of behavioral couples therapy for alcoholic men and their spouses (McCrary, Epstein, & Kahler 2004). Participants received up to 15 sessions of standard behavioral couples therapy (BCT), BCT plus a relapse prevention enhancement, or BCT plus efforts to increase attendance at self-help meetings. Couples in BCT plus relapse prevention who completed at least 5 sessions in the first phase of the study were offered the booster sessions; however, they attended an average of only 2.4 of these sessions. The three treatment conditions did not differ on alcohol use outcomes over an 18 month follow-up. A small sample size and the low number of continuing care sessions provided may have contributed to the lack of significant effects in this study.

Prison-based therapeutic community interventions. Several studies have evaluated the impact of multi-stage, prison-based treatment program, which generally consist of three components: prison therapeutic community, post-release transitional therapeutic community, and outpatient "aftercare." The total planned duration of care in these programs across all of the stages typically exceeds one year. An evaluation of such a multi-stage system with 359 inmates in the Delaware correctional system found that those who were randomly assigned to receive all three treatment stages had lower rates of drug use and arrests over an 18 month follow-up than those

randomized to a no TC control condition (Inciardi et al., 1997). In another evaluation of a multi-stage treatment model, 715 inmates in the California prison system were randomized to either a TC program or a no treatment control, and followed for five years. Results indicated that inmates who received the TC had lower incarceration rates than those in the control condition, but there were no differences on substance use outcomes (Predergast et al. 2004).

Pharmacotherapy interventions. Several studies conducted in Europe have evaluated the efficacy of Acamprosate in randomized designs with treatments of 48 to 52 weeks (Besson, Aeby, Kasas, Lehert, & Potgieter 1998; Paille et al., 1995; Sass, Soyka, Mann, & Zieglansberger 1996; Whitworth et al. 1996). Although acamprosate's mechanisms of action are not entirely clear, it appears to reduce neuronal excitability and acts as a GABA receptor agonist. In these studies, the alcoholic participants were also offered outpatient therapy. In each study, the acamprosate conditions produced better alcohol use outcomes than placebo. However, a large scale study of the opiate receptor blocker naltrexone did not yield positive results (Krystal, Cramer, Krol, Kirk, & Rosenheck 2001). In this study, 627 veterans (almost all men) with chronic, severe alcohol dependence who had been abstinent for at least five days were randomly assigned to 12 months of naltrexone, 3 months of naltrexone followed by 9 months of placebo, or 12 months of placebo. All patients were offered individual counseling and were encouraged to attend Alcoholics Anonymous meetings. At 52 weeks, there were no significant differences among the three groups in the percentage of days on which drinking occurred and the number of drinks per drinking day.

Methadone maintenance is generally thought to be the treatment of choice for opiate addicts, particularly those with lengthy histories of addiction (Ball & Ross 1991). Much of the evidence that supports longer-term methadone maintenance comes from observational studies (Ball & Ross 1991; Simpson, Joe, & Brown 1997) and natural experiments in which methadone maintenance programs were closed (Anglin, Speckart, Booth, & Ryan 1989). However, a recent

study used an experimental design to compare a 16 month methadone maintenance protocol to a gradual detoxification program that consisted of two phases: 6 months of methadone plus enhanced psychosocial services, and an additional 8 months of individual and group therapy (i.e., aftercare). Results indicated that the methadone maintenance intervention produced better treatment retention and lower heroin use rates than the comparison condition (Sees et al. 2000). A randomized, double-blind study (Newman & Whitehill 1979) compared methadone maintenance to a gradual methadone detoxification in patients who were also receiving a broad array of supportive services. Outcomes at 32 weeks and 3 years showed much higher rates of continued attendance in treatment in those receiving methadone maintenance.

Finally, Hall, Humfleet, Reus, Munoz, and Cullen (2004) conducted a study that examined extended pharmacological and behavioral treatments for smoking cessation. Smokers were randomized to one of four treatment conditions in a two-by-two design (nortriptyline vs. placebo and short vs. extended treatment). The short treatment groups received 8 weeks of medication, five group counseling sessions, and nicotine patches. Those randomized to the extended conditions received an additional 44 weeks of medication, 9 monthly counseling sessions, and between session checkup telephone calls. At the week 52 follow-up, smoking point-prevalence abstinence rates were highest in the extended nortriptyline condition (50%), followed by the extended placebo condition (42%), the placebo brief treatment condition (30%), and the brief nortriptyline condition (18%).

### Monitoring

Regular monitoring of symptom severity levels and status over time by patients or their health care providers is considered a standard component of care for a number of chronic disorders, including hypertension, diabetes, asthma, and obesity. In the addictions, the potential therapeutic effects of four monitoring approaches have been studied: follow-up assessments,

assessments plus referral to treatment when warranted, ongoing monitoring via telephone, and ongoing monitoring and brief counseling.

Follow-up assessments. Over the prior 30 years, a number of investigators have asserted that regular research follow-ups in addiction treatment outcome studies constitute a form of continuing care, and may at least in part account for the good substance use outcomes frequently observed in research studies (Clifford & Maisto 2000; Gallen 1974; Project MATCH Research Group 1997, 1998; Sobell & Sobell 1981). Two experimental studies published in the 1980s (Maisto, Sobell, Sobell, & Sanders 1985; Ogborne & Annis 1988) examined the potential effects of different follow-up assessment protocols on treatment outcome, and found no significant differences. However, Clifford and Maisto (2000) noted that both studies were underpowered and had other methodological shortcomings.

Clifford and colleagues took advantage of a change in the follow-up protocol in an alcohol treatment outcome study to conduct a quasi-experimental study of the impact of research follow-up assessments on long-term alcohol use outcomes (Clifford, Maisto, Franzke, Longabaugh, & Beattie 2000). The study compared outcomes in three groups of study participants: those who completed six regular follow-up interviews scheduled at 4-month intervals over two years, those who missed some of these six regular follow-ups, and those who were also scheduled for interviews every 4 months in year 1, but were scheduled for only one delayed follow-up interview in year 2. The results of within-subject analyses indicated that participants in the third group had drinking outcomes that deteriorated in year 2 relative to year 1, whereas those in the two groups with regular research follow-ups in year 2 had relatively stable outcomes. In between-groups analyses, outcomes in year 2 were generally worse in the third group than in the group that completed all six assessments, and in some cases worse than outcomes in the group that did not complete all six assessments but was scheduled for assessments in year 2.

Assessments plus referral. Dennis, Scott, and colleagues from Chestnut Health Systems have developed a protocol that they refer to as “Recovery Management Checkups” (RMC), which is designed to better manage patients with substance use disorders over time (Scott & Dennis 2002). In this protocol, substance abusers who have entered treatment are followed and interviewed every three months. For those individuals who are not currently in treatment or in a controlled environment such as jail, need for further treatment is determined through a relatively brief assessment. The criteria for needing further treatment consists of meeting any of the following over the prior 90 days: use of any substance(s) on 13 or more days, being drunk or high for most of one or more days, not meeting work/school/home responsibilities on one or more days, having substance use-related problems in the prior month, having withdrawal symptoms in the prior week, and the desire to return to treatment. Individuals who met criteria for need for treatment were immediately transferred to a linkage manager, who used motivational interviewing techniques to help the participant recognize and acknowledge the problem and need for treatment, addressed any existing barriers to re-entering treatment, and arranged scheduling and transportation to treatment.

The RMC protocol was evaluated in a study in which 448 adults presenting at a central intake unit were randomized to RMC or quarterly research follow-ups and followed for 24 months (Dennis et al. 2003; Scott et al. in press). The results of the study indicated that the RMC intervention led to better management of the patients over time. First, patients in RMC were more likely to be readmitted to treatment, were readmitted sooner, and received more treatment during the two year follow-up than those in the control condition. Second, patients in RMC had better substance use outcomes over the course of the follow-up than those in the control condition. Specifically, RMC patients were less likely to meet criteria for needing treatment in 5 or more quarters than patients in the control condition (23% vs. 32%).

Ongoing monitoring via telephone. In studies that have made use of Interactive Voice Response (IVR), participants make daily telephone calls to a computer and provide answers to a series of questions by pressing numbers on the telephone key pad. Researchers at the University of Vermont have conducted a series of studies in which IVR has been used to obtain daily reports of alcohol use and other factors over periods of a year or longer (Helzer, Badger, Rose, Mongeon & Searles 2002). Compliance in these studies has been very high, with over 93% of calls made (Searles, Helzer, Rose, & Badger 2002). However, these rates are likely due at least in part to the use of monetary incentives.

Noting the self-monitoring function served by IVR, these researchers speculated that daily reporting of alcohol consumption over an extended period of time might lead to reduced levels of drinking (Helzer et al. 2002). To test this hypothesis, a sample of heavy drinkers who were not seeking treatment were recruited for a study of the effects of daily IVR reporting of alcohol use over a two-year period. The results indicated that reported alcohol use, as indicated by frequency of drinking, drinks per day, and drinks per drinking day, declined by approximately 20% from the first to the second year. At least some reductions in drinking were observed in 82% of the participants. Moreover, the effect of reporting seemed to be specific to alcohol use, as there were no significant changes in nonalcohol-related measures. One of the weaknesses of this study is that there was no control group. However, given that the participants were not treatment seekers, who generally enter treatment—and treatment research studies—when they have been through a period of particularly heavy use, the reductions in alcohol use observed in this study are less likely to represent regression to the mean.

Ongoing monitoring and brief counseling. A study conducted in Sweden examined the effect of an extended intervention for middle-aged, heavy drinking men that consisted of brief visits with a physician every three months, and monthly visits with a nurse that included a test of GGT levels (Kristenson, Ohlin, Hulten-Nosslin, Trell, & Hood 1983). The intervention lasted for up to four years, with reductions in the frequency of therapeutic contact once sustained reductions in GGT were achieved. Participants who received the extended intervention had fewer sick

days, fewer hospital days, and lower mortality rates over the six year follow-up, compared to participants in the control condition, which consisted of an initial screening for feedback of GGT test results via letter, and invitations every two years to repeat the baseline GGT test. Longer-term mortality rates (e.g., 10-16 years) were also lower in the extended intervention condition (Kristenson et al. 2002).

Lieber and colleagues conducted a study of extended monitoring and counseling for 789 heavy drinkers with significant alcoholic liver disease (Lieber, Weiss, Groszman, Paronetto, & Schenker 2003). Patients received comprehensive monthly visits with a nurse and brief visits with a physician for as long as five years, with approximately half of the sample participating for at least two years. The sessions contained the main elements of brief interventions, including feedback, personal responsibility for change, advice, menu of change options, empathy, and self-efficacy boosters (Bien et al. 1993). Participants' alcohol consumption dropped from 16 drinks per day prior to enrollment, to 2.5 drinks per day thereafter. However, it is difficult to interpret these results due to the lack of a control group and the high attrition rate.

In a study by Stout and colleagues (Stout et al. 1999; Hilton et al. 2001), alcohol dependent graduates of day hospital programs were randomly assigned to receive standard follow-up care, which was minimal, or a series of telephone care management calls delivered over a 24-month period. The 15-30 minute telephone care management contacts were monthly for the first three contacts, at six-week intervals for the next two contacts, and at two-month intervals thereafter, for a total of 15 possible contacts. At each contact, a counselor assessed the patient's current level of functioning on a 5-point scale, which ranged from no problems reported to alcohol/drug use with negative consequences. The protocol provided instructions to counselors on how to respond to patients at each level on the scale. When level of functioning deteriorated, counselors could increase the frequency of the contacts, involve significant others, make referrals to formal treatment, and so forth (Stout et al., 1999). Although initial reports on the outcomes from this study were encouraging (Hilton et al., 2001), final results have not yet been published.

New Developments in Treatment with Implications for Extended InterventionsAdaptive Interventions

Adaptive, or flexible, treatment protocols are interventions that are modified over time in response to changes in symptoms and functioning (Collins, Murphy, & Bierman 2004; Lavori, Dawson, & Rush 2000; Murphy 2003). In many areas of medicine, guidelines for clinical care follow an adaptive framework. For example, hypertensive patients who do not respond to changes in diet and physical activity levels are usually prescribed beta-blockers and/or diuretics. Those who either do not respond to these medications or have undesirable side effects are then prescribed other medications. In many cases, two or more medications must ultimately be prescribed to provide adequate control of blood pressure without side effects severe enough to interfere with compliance (ALLHAT Collaborative Research Group 2002).

Adaptive treatment protocols may hold considerable promise for improving the long-term management of addictive disorders, because they are a good match for the clinical course of these disorders. Specifically, individuals with substance use disorders frequently go through periods of abstinence or non-problematic use after receiving an episode of treatment. During these periods, they are not likely to be willing to continue to attend regular face-to-face treatment sessions at a chemical dependency program beyond a few months. However, many of these individuals will eventually engage in problematic drinking or drug use again. At that point, it may be difficult to reach the substance abuser and re-engage him in treatment. In an adaptive treatment protocol, the level or intensity of treatment is substantially reduced when patients are doing well, in order to relieve burden on the patient, promote greater compliance with treatment, and reduce costs. However, some degree of regular contact is maintained, so that worsening of symptoms or deteriorations in functioning can be caught more quickly, and increased frequency or intensity of care arranged when necessary. In the addictions, there are examples of two kinds of adaptive treatment studies, stepped care and continuation protocols.

Stepped care. In the stepped care approach (Breslin, Sobell, Sobell, Buchan, & Cunningham 1997; Sobell & Sobell 2000), patients are started at what is determined to be the lowest appropriate level of care, and then “stepped-up” to more intensive treatment if warranted by poor initial response. Brooner and Kidorf (2002) have developed a stepped care treatment approach for methadone patients, which features three levels of counseling intensity. Patients begin in Step 1, which consists of one individual counseling and one group educational session per week. If patients miss a counseling session or have a drug-positive urine test, they are moved to Step 2, which includes a second weekly group session. Further missed sessions or drug-positive urine tests result in transfer to Step 3, which involves 2 individual and 5 group sessions per week. Patients who have been stepped up can move back down to Step 1 by attending all counseling sessions and providing drug-free urine samples. Recent studies indicate that this stepped care approach works equally well in methadone clinics or at physicians’ offices (King et al. 2002), can be adapted to increase employment rates in methadone patients (Kidorf, Neufeld, & Brooner in press), and can be further improved through the use of additional contingencies to motivate adherence to the protocol (Brooner et al. 2004).

A stepped care intervention for problem drinkers was evaluated by Breslin et al. (1999). Participants who continued to drink during an initial four session intervention were randomly assigned to receive or not receive an additional counseling session and two supplemental personalized progress reports. The results indicated no differences in drinking outcomes between the two groups, although this was not surprising given the very low intensity of the additional treatment and the small sample size.

Continuation treatments for initial responders. The second adaptive treatment approach involves the evaluation of “step-down” or continuation treatments for patients who are initial treatment responders. The American Society of Addiction Medicine (ASAM) has attempted to provide guidelines on when patients can be stepped down from more to less intensive interve-

tions, through the “Continuing Care” criteria (ASAM 2001). However, these criteria have not been formally evaluated. O’Malley et al. (2003) conducted a study of naltrexone in alcohol dependent patients that focused on optimal continuation treatments for initial responders. Patients were first randomized to either naltrexone plus primary care counseling or naltrexone plus specialized alcohol counseling (i.e., cognitive-behavioral therapy). Patients in each condition who achieved what was considered to be a good response to the medication were then randomized for second time to either extended naltrexone or placebo, along with continuation of the behavioral treatment they had been receiving. Results from the maintenance phase indicated that patients receiving primary care counseling had better drinking outcomes if they received extended naltrexone, whereas those who received CBT did not benefit from extended naltrexone (O’Malley et al. 2003).

The second study (McKay, Lynch, Shepard, & Pettinati 2005b) compared a telephone-based monitoring and brief counseling intervention against two more intensive, clinic-based interventions—individual relapse prevention and standard group counseling—in graduates of 4-week intensive outpatient programs (IOPs). The three continuing care conditions were all 12 weeks in length. The telephone-based condition was a multi-modal intervention that included an initial face-to-face orientation session in the week after IOP, weekly group support sessions in the first 4 weeks, and 12 weekly 15-20 minute telephone sessions. The telephone sessions consisted of monitoring of any recent substance use, a review of progress over the prior week toward therapeutic goals established in the orientation session, suggestions for coping with current problems, and planning for the upcoming week.

Results obtained over a 2-year follow-up indicated that the degree of progress made by patients toward the main goals of the IOP phase of care was a good predictor of which continuing care intervention would be most effective. Specifically, patients who failed to achieve a number of IOP goals, such as abstinence from alcohol and cocaine, regular participation in self-help, endorsement of a goal of abstinence, reasonable social support, and high self-efficacy for

coping with problems, had better substance use outcomes if they received standard group continuing care rather than the telephone-based condition. Conversely, telephone continuing care was more effective than group counseling for patients who had made better progress toward achieving IOP goals (McKay et al. 2005a, 2005b). These findings suggest that progress while in treatment can be used to make decisions about optimal further care, which is consistent with an adaptive approach to addiction management.

### Long-Acting Medications

One of the major problems with any extended intervention for substance use disorders is ongoing compliance with the treatment. A recent large-scale, multi-site study tested the efficacy of an injectable form of the medication Naltrexone for the treatment of alcohol dependence (Garbutt et al. 2005). Patients in the study received one injection per month for six months of either 380 mg Naltrexone, 190 mg Naltrexone, or placebo, along with a low intensity psychosocial intervention. The major difference between oral naltrexone and the injectable form is that once a patient had received an injection, the daily decision regarding whether to take the medication or not is eliminated and “compliance” is assured—at least for 30 days.

Results indicated that compared to placebo, the larger dose of naltrexone reduced heavy drinking by 25%, while the smaller dose reduced it by 17% over the six month study period. Treatment effects were larger in men than in women. Compliance with the injection schedule was relatively good; approximately 65% of the patients in each condition received all 6 injections. Although these treatment effects were relatively modest, they do suggest that injectable Naltrexone may be a useful therapeutic component in extended interventions for alcohol dependence. For example, in an adaptive intervention, patients who are not achieving good compliance with either psychosocial treatment or oral medication might be switched to an injectable form of the medication, in an effort improve compliance and outcomes over time.

### Discussion

The goal of this review was to examine whether a case can be made for extended interventions for alcohol and drug use disorders. The answer appears to be a tentative “Yes,” based on what must be viewed as a relatively small body of direct and, in some cases, indirect evidence. Most of the behavioral and pharmacological extended interventions reviewed in this article yielded positive effects, although there was two exceptions (Krystal et al. 2001; Predergast et al. 1997), and several other studies with various methodological limitations that produced mixed results (Braukmann et al. 1985; Dahlgren & Willander 1989; McCrady et al., 2004; Ojehagen et al. 1992; Tomson et al. 1998). However, in many studies the extended interventions were compared to relatively low intensity or placebo control conditions, rather than to shorter versions of the same intervention, which raises questions about how “extended” an extended intervention needs to be for effective addiction management. At this point, more studies that directly compare extended behavioral and pharmacological interventions to “treatment as usual” or shorter versions of the same interventions are clearly needed before any firm conclusions can be drawn about the utility of extended treatment in the addictions.

The remainder of this section will raise several issues to consider when designing and evaluating extended interventions, including new developments in treatments for other chronic disorders, the role of self-help programs, implications of early drop out and poor compliance, incorporation of pharmacotherapy, and economic challenges. In the final part of the this section, new studies of adaptive extended treatments that are currently underway are described, and concluding remarks are made concerning further research needed to inform the development of new models of extended care in the addictions.

#### Considerations in the Design of Extended Interventions

New developments in treatment of other chronic disorders. It is worth noting that treatment guidelines for many other chronic disorders, including hypertension, depression, diabetes,

and obesity, increasingly conceive of treatment as a long-term collaboration between clinician and patient, characterized by regular monitoring of symptoms and adjustment of treatment when necessary (ALLHAT Collaborative Research Group 2002; Berkowitz et al. 2003; Look AHEAD Research Group 2003; Riegel et al. 2002; Rush et al. 1998; Welton et al. 1998). For example, a recent multi-center study of medications for depression (Rush et al. 1998) featured three phases: acute safety and efficacy (12 weeks), continuation (16 weeks), and maintenance (76 weeks). The Rush et al. study also has an adaptive component, in which patients who do not respond to their original medication in the acute safety and efficacy phase are crossed over to the alternative medication for another 12 week acute phase trial. These ambitious, long-term studies of novel disease management approaches for the treatment of other chronic disorders provide inspirational examples of what might be possible in the addictions.

Role of self-help and self-management. One point that is frequently raised regarding extended treatment for addictions is that it is already widely available, through Alcoholics Anonymous and other types of mutual- or self-help programs. There is little question that individuals who frequently attend AA and other self-help programs usually do better than those who do not (Tonigan et al. 1996). For example, in a sample of individuals with alcohol use disorders who had not received professional treatment, faster affiliation with AA and longer participation predicted better 1- and 8-year alcohol related outcomes. Individuals who attended AA at least 5 times per week for the first year had almost a 90% likelihood of abstinence at one year, and participation in AA had a positive effect on alcohol related outcomes over and above the effects of formal treatment (Moos & Moos, 2004). However, studies have also consistently shown that rates of self-help attendance tend to be relatively low and drop off rapidly after treatment has ended (McKay et al. 2001; Tonigan et al. 1996).

Generally speaking, treatment protocols for most chronic disorders now pay considerably more attention to the behavior of the patients than was the case in the past. For example, in the

Chronic Care Model (CCM; Wagner et al. 2001), which is gaining wider acceptance in medical circles, patients participate actively in monitoring symptoms, and are responsible for acquiring self-management skills and accessing community resources. More work is needed to strengthen the ability of addiction treatment—whether extended or not—to successfully link patients to self-help programs and support their ongoing participation in them (Humphreys 1997, 1999).

Implications of high treatment attrition rates and poor compliance. When considering the clinical utility of extending treatment for substance abusers, one important question that must be addressed is what should be done with the high percentage of patients who drop out of outpatient treatment within the first month. At first glance, these individuals might seem like poor candidates for extended treatment. However, many early treatment dropouts might be willing to participate in some sort of ongoing brief monitoring, where they could be given repeated opportunities to re-engage with more intensive treatment, should it be warranted. The use of strategies to reduce early treatment dropout may be another avenue to increase the numbers of patients who could participate in extended intervention protocols. In this regard, McLellan and colleagues have recently proposed that regular monitoring of patients' progress while in outpatient treatment and providing that information immediately to clinicians—a process they have labeled Concurrent Recovery Monitoring (CRM)—might reduce dropout rates and improve outcomes (McLellan et al. 2005). This approach has also been shown to improve outcomes in studies of psychotherapy for other psychiatric disorders (Howard, Moras, Brill, Marinovich, & Lutz 1996; Lambert, Hansen, & Finch 2001).

One of the central conclusions of this article is that the “extended” portions of extended interventions will have to be of relatively low intensity, with adaptive provisions to increase level of care when needed. In order for this approach to work, patients will need to participate in low-level monitoring for long periods of time. Even more important, they will have to comply with recommended increases in level of care, when deteriorations in symptoms and functioning

occur. There is evidence that good compliance with monitoring can be achieved over long periods of time (Hilton et al. 2001), particularly if incentives are provided (Searles et al. 2002). However, it is likely that compliance with stepped up care will not be as good, and methods will need to be developed to increase patients' willingness to return to more intensive forms of treatment until stabilization is once again achieved. For example, Dennis et al. (2003) have combined motivational interviewing approaches, aggressive case management, and rapid intake to treatment in their RMC protocol, which has improved rates of treatment re-engagement among former patients in need of additional treatment. It may also be possible to develop systems of incentives to reward participation in stepped up care (Brooner & Kidorf 2002; Iguchi et al. 1996).

The issue of compliance with increases in level of care is of particular concern in addictions treatment, due to a relative lack of distinctly different interventions at the same level of intensity to which a patient could be switched if the current intervention is not producing good outcomes. In the treatment of conditions such as depression or hypertension, for example, patients who do not respond to an initial medication can be switched to another medication, or have a second or third medication added to the original medication, with little if any increased burden to the patient. In fact, in some cases side effect profiles and efficacy are improved when a patient is taking smaller doses of several medications, rather than a large dose of any one medication. Conversely, at this point the only real option for most substance abusers who are not doing well in treatment is to increase the frequency or intensity of care. This usually does not make treatment more attractive.

Role of pharmacotherapy. Relatively little has been said in this article regarding the use of medications in extended interventions for addiction. With the exception of acamprosate, there have been only a few controlled studies of the effectiveness of medications provided for more than six months, and the vast majority of medication studies have been 8 to 12 weeks in duration.

Perhaps more important, there has been little work on the targeted use of medications at various points in extensive interventions, or on the adaptive use of medications in such interventions, at least in substance dependent individuals (but see Kranzler et al. 2003, and Kranzler, Armeli, Feinn, & Tennen 2004, on targeted use of naltrexone with problem drinkers). For example, compliance with extended care might be improved if alcoholic patients who relapse during the post-treatment monitoring phase were given the choice to take a medication such as naltrexone or acamprosate combined with intensified monitoring, rather than return to standard outpatient treatment. As more effective medications are developed, and better information is available on which patients respond best to what medications (Oslin et al. 2003), the potential role of pharmaceutical agents within extended interventions will no doubt be greatly expanded.

Economic issues. In the current economic climate, it has become common to recommend studies of whether new interventions are cost-effective relative to other interventions, and whether they show economic benefit—i.e., they save more money for important stakeholder groups than they cost to implement (French et al. 2000; Zarkin, French, Anderson, & Bradley 1994). Clearly, extensive interventions for addictions are more likely to be adopted if in addition to being proven effective, they can be shown to have favorable impact on the bottom line of the agencies that fund substance abuse treatment. Therefore, cost-effectiveness and benefit-cost analyses of extended addiction interventions are needed and should be done (Salome, French, Miller, & McLellan 2003). However, it is also important to recognize that the “benefits” of extended treatment interventions are likely to extend far beyond the specific agency that funds the treatment, and may be spread across society in a way that is hard—if not impossible—to accurately measure. So, while the costs of an intervention can be measured with great precision, the benefits may well be underestimated. In any event, much work will be required with the agencies and policy makers that fund substance abuse treatment and the service providers themselves to develop mechanisms to generate reimbursement for extended interventions.

Next Steps in the Design and Evaluation of Extended Interventions

Two studies currently underway at the University of Pennsylvania are testing new approaches to the management of alcohol dependence that make use of extended adaptive protocols. The first study (David Oslin, PI) is designed to identify optimal treatment tracks for patients who do and do not demonstrate a good initial response to naltrexone. The first component of the study examines stepped care for alcohol dependent patients who have a poor initial response to an open label trial of naltrexone paired with minimal psychosocial counseling. Patients who continue to drink during this initial phase of care are transferred to a more intensive psychosocial intervention, and then randomized to either continue or not continue on naltrexone. Patients who achieve consistent abstinence during the open label portion of the trial—the “responders”—are entered into an arm of the study in which they are randomized to receive or not receive extended care, in the form of telephone monitoring. All responders also are given additional prescriptions for naltrexone.

The second study (James McKay, PI) is evaluating the effectiveness of an 18-month adaptive disease management protocol for alcohol dependent patients who have achieved an initial positive response to intensive outpatient treatment (IOP), as evidenced by good attendance for two weeks. The adaptive protocol is built around brief telephone contacts that consist of an assessment of risk for relapse and brief problem-focused counseling. The calls, which are initiated while patients are still in IOP, are scheduled at one week intervals early in the protocol, with the frequency decreasing over time to one call per month. When risk levels increase, participants receive stepped up care that can include more frequent telephone sessions, several sessions of motivational interviewing (Miller & Rolnick 1991), a course of relapse prevention, or linkage back to the IOP. The primary control condition is IOP treatment as usual.

This evaluation of a telephone-based disease management intervention is the only study we are aware of in the addictions in which an adaptive treatment protocol is examined within the

context of a treatment protocol that is a year or more in planned duration. Therefore, little is currently known about how well substance abusers will comply with recommended changes in level of care as they are followed over time. However, there is reason to believe that many more substance abusers would evince better long-term compliance with lower intensity, flexible interventions than with those that require continued attendance at treatment facilities. In a similar vein, compliance with medications that have mild side-effect profiles is usually better than with medications that have more unpalatable side-effects.

It is beyond the scope of this article to present a detailed proposal for what an optimal extended intervention model might look like. However, several suggestions seem warranted. Extended interventions should include a menu of services that range from relatively high intensity (i.e., intensive outpatient) to low intensity (i.e., telephone- or internet-based monitoring), that can be flexibly administered and adjusted according to current symptom status and level of functioning. They should be geared toward maintaining contact with the patient for extended periods (i.e., years rather than months) during which much of the contacts will be at low intensity levels. Although the optimal frequency of such contacts has yet to be determined, there is some reason to believe that anything less frequent than once per month, at least in the first year of recovery, might not be adequate. With regard to setting, extended interventions could be delivered through chemical dependency specialty programs, but there may be advantages to more active efforts to link these models with primary medical care or other forms of treatment that follow patients over time (Samet, Friedmann, & Saitz 2001; Weisner, Mertens, Parthasarathy, Moore, & Lu 2001).

Empirically-based protocols will be needed to provide clinicians with decision rules that specify when and under what circumstances patients should be moved from one level of treatment intensity to another. Since compliance over time is likely to be a major challenge, more creative work on possible incentives for consistent participation and compliance with recommended “stepped up” care is needed. Finally, it will be particularly important to devote consid-

erable attention to making each aspect of extended treatment protocols more attractive to patients. This will require having several available treatment options—including medications—at all phases of the protocols, and will likely necessitate assigning greater weight to patient preferences in decisions regarding treatment type and intensity. Although the field is lacking in good theories about factors that facilitate the maintenance of behavior change (Rothman 1999), individuals are surely more likely to continue to participate in extended treatment protocols if they enjoy the therapeutic contacts, find the interventions not unduly burdensome, and feel that they have a say in the nature of the treatment they receive at any given point.

Each of these recommendations can also be seen as an indicator of the need for further research. For example, research is needed to determine criteria for when it is appropriate to move patients between different levels of care, optimal frequencies of contact at each stage of treatment, better ways to enhance compliance with regular monitoring and stepped care, whether extended interventions are best delivered in specialty clinics or through primary care, the role of patient-directed activities such as choice in selection of care options and participation in outside support groups (e.g., AA), and how to maximize the effective participation of family members. As was suggested at the beginning of this article, individuals with substance dependence who have failed in prior treatment attempts are probably the most likely candidates for longer-term care. However, more research is needed to determine if this is really the case, as the findings of Kristenson et al. (1983) suggest that heavy alcohol users who do not meet criteria for dependence may also benefit from extended contact with treatment providers who monitor their alcohol use and provide feedback and encouragement to drink less. Finally, the issue of how to determine when patients are ready to transition primarily to self care will require further investigation.

In conclusion, new developments in treatments for addiction and other disorders suggest that moving from an acute care model to an adaptive, extended care approach could lead to significant improvements in long-term outcomes for individuals with substance use disorders. Im-

plementation of these models may also ultimately reduce the overall costs to society of substance abuse use disorders, primarily by reducing the utilization of expensive, unplanned acute care treatments and contacts with the criminal justice system through better disease management. Finally, extended care models have the potential to increase quality of life for afflicted individuals and their families, provided these models in fact lead to better addiction management over time. However, additional research is clearly needed to increase compliance with and maximize the feasibility, efficiency, and effectiveness of these interventions.

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## Acknowledgements

This research was supported by grants K02 DA000361 from the National Institute on Drug Abuse and R01 AA14850 from the National Institute on Alcohol Abuse and Alcoholism. I would like to thank Drs. Michael Dennis, Kevin Lynch, Thomas McLellan, Jon Morgenstern, Susan Murphy, David Oslin, Christ Scott, and Robert Stout for their creative work in the areas of addiction management and adaptive treatment designs, as well as their helpful advice and consultation on my own research. I also thank John Finney, Michael Prendergast, and Frank Pearson for access to their treatment study data bases. Finally, the comments of Thomas McLellan, two anonymous reviewers, and the series editor, Keith Humphreys, concerning an earlier draft of this article greatly facilitated the process of revision.