

Regular article

## Network therapy: Decreased secondary opioid use during buprenorphine maintenance

Marc Galanter, M.D. \*, Helen Dermatis, Ph.D., Linda Glickman, Ph.D., Robert Maslansky, M.D.,  
M. Brealyn Sellers, M.D., Erna Neumann, M.A., R.N.C., Claudia Rahman-Dujarric, B.A.

*Division of Alcoholism and Drug Abuse, New York University Department of Psychiatry, NYU Medical Center, New York, NY, USA*

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### Abstract

Network therapy (NT) employs family members and/or friends to support compliance with an addiction treatment carried out in office practice. This study was designed to ascertain whether NT is a useful psychosocial adjunct, relative to a control treatment, for achieving diminished illicit heroin use for patients on buprenorphine maintenance. Patients agreeing to randomization to either NT ( $N = 33$ ) or medication management (MM,  $N = 33$ ) were inducted onto short-term buprenorphine maintenance and then tapered to zero dose. NT resulted in significantly more urine toxicologies negative for opioids than MM (65% vs. 45%) and more NT than MM patients (50% vs. 23%) experienced a positive outcome relative to secondary heroin use by the end of treatment. The use of NT in office practice may therefore improve the effectiveness of eliminating secondary heroin use during buprenorphine maintenance. It may also be useful in enhancing compliance with an addiction treatment regimen in other contexts. © 2004 Elsevier Inc. All rights reserved.

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### 1. Introduction

Network therapy (NT) is an office-based treatment for substance abuse (Galanter, 1993a, 1993b) that engages a group of a patient's family or friends in therapy sessions along with the patient. This is carried out in addition to individual therapy, and can be combined with a referral to a Twelve-Step program. The network sessions are employed to help the patient draw on potent cohesive ties to family and friends to stabilize compliance with a treatment plan. The active ingredients of NT emerge out of a cognitive-behavioral focus. They do so by adding on a family/supportive component for augmenting the cognitive focus with the support of closely related drug-free collaterals (friends/family). Network Therapy incorporates some of the components of both Community Reinforcement (Azrin, Sisson, Meyers, & Godley, 1982) and Behavioral Marital Therapy (O'Farrell & Fals-Stewart, 2003), such as behavioral skills training and medication monitoring by a significant other, but may be more amenable to the treatment of

patients in a private practice setting. Cognitive Behavioral Therapy differs from NT in that it focuses on the patient's cognitive and behavioral response to coping with cues to relapse with little attention to support from others and, in so doing, approximates treatment typically administered in outpatient substance abuse settings involving a 1:1 setting of client and therapist.

Network therapy has been shown to be useful in yielding diminished drug use (Galanter, Keller, & Dermatis, 1997a; Keller and Galanter, 1999; UKATT Research Team, 2001; Copello, Oxford, Hodgson, Tober, & Barrett, 2002; Galanter, Dermatis, Keller, & Trujillo, 2002; Rothenberg et al., 2002). Here we present results of a controlled study designed to ascertain whether NT can enhance compliance with addiction treatment. A specific aspect of treatment outcome was chosen for evaluation in this study, namely, the avoidance of illicit opiate abuse during buprenorphine maintenance.

Most studies to date on buprenorphine maintenance show that many subjects continue to use heroin over the course of their treatment. One multi-site study illustrated this problem in the context of managing patients in physicians' individual offices (Fudala et al., 2003). Patients were maintained on buprenorphine for as much as a year, and urine toxicologies

\* Corresponding author. Tel.: +1-212-263-6960; fax: +1-212-263-8285.  
E-mail address: marcgalanter@nyu.edu (M. Galanter).

were reported to be negative for illicit opiates in only 18% of urine samples from the patients treated with a buprenorphine/naloxone combination, and 21% with buprenorphine alone. This suggests a need for a psychosocial treatment approach to be used in office practice concomitant with this modality in order to yield diminished illicit opiate use. It is therefore useful to evaluate the utility of NT against a control treatment for the enhancement in outcome of a pharmacotherapy which is increasingly coming into use.

## 2. Materials and methods

### 2.1. Patient selection

Subjects were drawn from a pool of volunteers solicited from substance abuse referral sources at New York University and from advertisements in local newspapers. To be included, they had to be diagnosed as heroin dependent by DSM-IV criteria with no distinction made between insufflation and intravenous use as admission criteria, be between the ages of 21 and 65, accept random assignment to either of the two behavioral treatment conditions, and bring to intake a drug-free family member or friend who could support them in their recovery. Applicants with pre-existing major Axis I general psychiatric disorders were excluded. This study was approved by the New York University School of Medicine Institutional Board of Research Associates for random assignment of patients to short-term buprenorphine maintenance with adjunctive treatment either by Network Therapy or by medication management. All the subjects and collaterals provided written informed consent.

Subsequent to initial phone contact, 86 patients were interviewed and 20 patients did not participate because they were deemed ineligible due to dependence on secondary drugs, a DSM-IV major psychiatric disorder, or lack of a suitable collateral. Other treatment options that were available included methadone maintenance treatment and ambulatory treatment programs as well as drug-free Therapeutic Community treatment. In contrast to the other treatment options, the NT-buprenorphine treatment program was provided at no cost to the patient.

### 2.2. Buprenorphine regimen

Patients were told that the 18-week period of study would involve an induction and maintenance, and then a taper off buprenorphine. They were told to abstain from heroin for 24 h before the initial dose of buprenorphine, and were instructed on the importance of avoiding illicit opiates over the course of their treatment. Buprenorphine combined with naloxone (the latter to prevent diversion for intravenous use) was administered sublingually in tablet form. It was made available by the National Institute on Drug Abuse with FDA IND approval.

An initial dose of 8 mg was administered on day 1, and increased to 16 mg on day 2 and then maintained through week 5. The taper was initiated at week 6 so that by the end of week 9 the dose was at 8 mg. Patients were brought down to zero dose by the end of week 15. Two daily doses were provided on Friday to be self-administered on Saturday and Sunday. During taper, daily reductions ranged from 1.0 mg to 0.1 mg, with clonidine and trazodone prescribed p.r.n. Subjects were blind to their day's dose (or placebo) throughout the study.

### 2.3. Network therapy vs. medication management

The psychosocial therapy was designed to be done by psychiatric residents in their respective offices. They had no previous experience in ambulatory addiction treatment, but were given a nine-session course followed by weekly supervision by addiction faculty. Separate trainings were given to each therapist group in either Network Therapy or Medication Management, depending on which treatment they would apply. Specific instruction was included on conveying to patients the importance of avoiding secondary illicit opiates.

Treatment for patients receiving NT was carried out according to our treatment manual (Galanter & Keller, 1994). It is based on a previously published volume on the NT technique (Galanter, 1993b), and adapted here for use with buprenorphine. The manual focuses on training network members to provide a supportive environment for the patients' adherence to a behavioral strategy, in this case, avoidance of secondary illicit opiates. The manualized format of NT has been shown by Keller, Galanter, and Weinberg (1997) to be discriminable from a systematically-oriented treatment.

In the initial session, the therapist and patient collaborate to select a small number of friends or family who will accompany the patient to intermittent joint sessions. This is planned in addition to individual therapy sessions which are carried out without network members. The network is used by the therapist to aid in instituting a pragmatic treatment plan to undercut denial and initiate and stabilize abstinence. Each network session begins with the patient recounting events related to cue exposure or to substance use since the last meeting. Network members are invited to comment on this report to assure that all are engaged in a mutual task with correct, shared information.

The treatment of patients receiving medication management (MM) was conducted in accordance with a set of procedures to guide the therapist in helping to monitor the patient's response and maintenance on buprenorphine. In addition to monitoring medication response and adherence to avoidance of illicit opiates, the therapist develops and fosters a patient-therapist alliance in which progress is rewarded through encouragement and support. The focus, however, is on the effect of the medication, and the therapist does not prescribe specific behavioral strat-

egies. Training was adapted from the MM manual developed by Fawcett, Epstein, Fiester, Elkin, and Autry (1987), as applied to buprenorphine management by Gordon (1994).

The treatment time allocations for Network Therapy and Medication Management conditions were equated, with each consisting of twice weekly 30-min sessions over the 18 weeks of the buprenorphine protocol. For Network Therapy, one of these weekly sessions consisted of psychosocial therapy with the patient's network of supportive family and friends and the second weekly session consisted of an individual psychosocial intervention. The two weekly sessions of the Medication Management condition consisted of an individual psychosocial intervention, as prescribed in the manual developed by Gordon (1994).

#### 2.4. Outcome measures

The treatment outcome was determined by means of two measures based on weekly urine toxicologies collected under observation. One was the percentage of the subjects' toxicologies that was found to be negative for opiate use during the course of treatment. This reflected the subjects' adherence to abstinence expectations while in treatment. The second outcome variable was whether or not all of the subjects' last three scheduled urine toxicologies were found to be negative for opiates. This reflected the goal for patients that they achieve an opiate-free state by the end of their treatment.

### 3. Results

#### 3.1. Subject characteristics

The study sample consisted of 66 patients with heroin dependence, whose mean age was 36, (*SD* 8.4), of whom 50 (76%) were male. Thirty-nine (59%) were White, 16 (24%) were Hispanic, 8 (12%) were Black, and 3 (5%) were Asian/other. The majority ( $n = 51$ , 77%) were living with family or friends and 44 (67%) were working either full-time or part-time. A majority ( $n = 34$ , 52%) had a history of arrests and 9 (14%) were on probation or parole. The mean length of heroin use was 12.3 years (*SD* 9.5). The most common route reported for heroin use in the 30 days prior to admission was insufflation (any self-administration at all by insufflation:  $n = 49$ , 74%), followed by intravenous use at all:  $n = 22$ , 33%) and smoking (any at all,  $n = 5$ , 8%). Most subjects ( $n = 48$ , 73%) had been treated previously for heroin addiction and 20 (30%) had a history of methadone maintenance treatment. There were no significant differences between patients in the NT condition ( $n = 33$ ) and those in the MM condition ( $n = 33$ ) on any of the aforementioned background characteristics.

#### 3.2. Treatment outcome

Overall, the 66 subjects were treated by 32 therapists, for an average of 69.4 (*SD* 51.1) days. Thirteen (20%) dropped out after receiving their first dose of buprenorphine and of those who continued beyond that point, 26 (39% of the entire sample) reached zero dose of buprenorphine after the taper. There was no significant difference between the NT and MM subjects on these variables.

#### 3.3. Impact of the behavioral treatments on outcomes

A total of 10 (30%) of the 33 patients never formed a network. After accounting for those who dropped out of the study after their first dose of buprenorphine ( $n = 8$ ), two patients were unable to form a network due to the collateral being unavailable.

Twenty-three (70%) of the 33 patients in the NT condition established a network. Among those who did, the mean number of network members in attendance across all network sessions was 1.74 (*SD* .81). Most networks were comprised of only family members (55%) or only friends (41%). The mean number of NT sessions was 9.7 (*SD* 4.35). Over the course of their treatment, patients in the NT condition had a higher percentage of opiate-free urines than did those in the MM condition (Mean 64.5, *SD* 32.3 vs. Mean 45.3, *SD* 39.7;  $t = 2.08$ ,  $p < .05$ ). However, within the NT condition, there was no relationship between network composition (family vs. friend) and percent opiate-free urines. The number of opiate-free urines in the NT condition was significantly correlated with the number of NT sessions attended ( $r = .49$ ,  $p < .05$ ). The number of opiate-free urines in the MM condition was not significantly correlated with the number of MM sessions.

Fifty of the 66 patients continued in treatment long enough to submit three urine toxicology samples. Those in the NT condition (12/24, 50%) were more likely to have had their last three urine toxicology results negative for opiates than those in the MM condition (6/26, 23%) ( $\chi^2 = 3.93$ ,  $p < .05$ ).

### 4. Discussion

A person's social environment and personal relationships are influential in determining the process of recovery, and social environmental factors have been found to be highly robust predictors of long-term positive outcome (Longabaugh, 2003). Psychosocial interventions that employ the use of family and peers have been shown to secure compliance with addiction treatment, as with spouses (McCrary et al., 1986; O'Farrell & Fals-Stewart, 2003), community reinforcement alone (Azrin et al., 1982) and community reinforcement and family training combined (Meyers, Smith, & Lash, 2003). Network Therapy has particular utility, as it can be applied in an

office practice setting by individual practitioners. Individual office practices, whether institutionally based in mental health clinics without enhanced addiction programming or in private practice, lack the adjunctive resources available in ambulatory substance abuse programs. Such resources may include psycho-education groups, group therapy, multidisciplinary staff, and even on-site Twelve-Step meetings.

As part of a NIDA Stage I Behavioral Therapy Development grant (R01-DA08518), we standardized administration of the NT technique and developed a didactic and clinical supervision procedure for instructing therapists in NT according to our treatment manual. We developed a rating system for clinical supervisors to calibrate NT trainees to the manual and used it to measure videotaped NT sessions for both treatment integrity and discriminability from other interventions. In that study, too, psychiatric residents were trained to conduct NT with sufficient adherence to the NT manual (Galanter et al., 1997a; Keller et al., 1997), a technique we employed in this study as well. Cocaine abusers treated with NT by psychiatry residents inexperienced in addiction rehabilitation achieved abstinence rates which were comparable to those in other successful clinical trials which had been reported at that time (Galanter et al., 2002). Furthermore, cocaine abusers treated with NT in addition to treatment-as-usual by counselors in a community based program achieved significantly greater abstinence than a cohort receiving treatment-as-usual alone (Keller & Galanter, 1999).

Network Therapy has been adapted for use in internet training (Galanter, Keller, & Dermatis, 1997b), has been employed in other studies (Copello et al., 2002; UKATT Research Team, 2001), and has been combined successfully with other interventions (Rothenberg, et al., 2002). Given clinician experience with NT, it is cited in the practice guidelines of the American Psychiatric Association as a means of enhancing compliance with addiction treatment (APA, 2002), and has been made available in video format by the APA (2003).

We have now extended the study of NT in the Stage II Behavioral Therapy Development format for assessing the effectiveness of NT relative to a non-network modality under controlled conditions, employing a format of short-term buprenorphine maintenance. In this current study, there was no difference between the two conditions in the rate of drop-out from treatment. Since instruction for both NT and MM subjects focused on the avoidance of illicit opiate use, retention was likely more a function of the response to buprenorphine as an engagement device than of the psychosocial treatment. Beginning PGY III residents were accustomed to medication management from their PGY I and II years, but had no prior experience with ambulatory addiction management, or family or group therapy. In addition, retention rates might well have been greater if patients did not experience withdrawal symptoms during taper, and were not led to expect a

predetermined termination date after a relatively short period of treatment.

Salient findings in this study were the following: residents succeeded in establishing a network for 70% of patients. This is consistent with our previous research on NT in which residents established a network in 77% of a sample of 47 cocaine dependent patients (Galanter et al., 2002). Over all subjects admitted, there was less evidence of secondary opioid use among patients treated with NT as opposed to MM: among NT subjects, 64.5% of urine toxicologies were negative for opiates, vs. 45.3% for the MM subjects. Additionally, the last three urine toxicologies were used as a surrogate for outcome regarding illicit opioid use at the end of treatment. On this count, a greater number of subjects in the NT condition achieved a positive outcome (50% vs. 23%). In addition, the percentage of opiate-free urines was correlated with the number of network sessions that took place, not with the number of individual sessions, nor with the social composition of the network. A similar pattern of findings assessing the relationship between percent of cocaine-free urines and NT characteristics was obtained in our previous study of patients with cocaine dependence. These findings suggest that the network sessions played a role in promoting compliance with the treatment outcome criterion and that the patient's family members or friends can be selected for participation in NT without differentially affecting the outcome.

The number of opiate-free urine toxicologies in patients in the current study can be compared to that reported in four recent studies on buprenorphine maintenance, although none of the four had patients on as little as 8 weeks of stable dosing followed by taper. Two groups of investigators conducted 13-week trials of maintenance. Mattick et al. (2003) maintained 200 subjects on buprenorphine in a public clinic where urine samples were collected at random times on a bi-weekly basis. They reported toxicologies negative for opiates ranging from an average of approximately 25% at week 2 to 45% at week 8. Fiellin et al. (2002) employed a manualized medication management procedure for 14 patients, and reported opiate-negative toxicologies in 44% of samples in the first 2 weeks of treatment and 71% in weeks 7 and 8.

Kakko, Svanborg, Kreek, & Hellig (2003) provided maintenance for 20 patients selected at random from a large sample of patients who had been admitted to an inpatient facility. Their patients were maintained on buprenorphine for 12 months with a 75% retention rate; 75% of the urine toxicologies overall were negative for opioids. The positive outcome in this latter study may be due to a number of factors: inpatient treatment prior to ambulatory care, urine toxicology monitoring thrice weekly, a program of combined individual and group treatment, and availability of maintenance for a full year.

One study like ours was conducted with counseling in individual office settings in one of three treatment

conditions (Fudala et al., 2003). The study was carried out at multiple sites for 48 weeks, with individual counseling by physicians experienced in addiction treatment. Most patients treated with buprenorphine were retained for at least 6 months, and 21% of urine toxicology samples in the buprenorphine/naloxone condition were negative for illicit opioids.

Altogether, it appears that more intensive support, like that carried out by Kakko et al. (2003) may provide an improved outcome. Similarly, the addition of family and peer support in our own study enhanced the outcome for patients relative to an alternative approach, namely, medication management, which was applied with equal frequency and time investment.

The treatment format applied here was similar to office-based practice by community-based therapists in terms of the use of individual practitioners' offices. Certain differences, however, between this study and office-based practice that will emerge now that buprenorphine will be used more widely, should be noted. These include the relative inexperience in drug abuse treatment of our treating physicians (residents in psychiatry), a limited period of maintenance, and an understanding by the patients that long-term treatment would not subsequently be available in the same setting.

One ecologic limitation of this study is therefore the inexperience of the therapists with the experimental NT treatment. Furthermore, the 33 NT patients were treated by 15 residents, so that each of them saw an average of only two cases. In our community study (Keller & Galanter, 1999), therapists with experience in addiction treatment were able to achieve successful results employing NT without individual supervision after only a series of group-based seminars. A subsequent study with experienced office-based therapists might yield a greater experimental effect. In any case, we were able to establish the effectiveness of Network Therapy in achieving an apparent improvement outcome for compliance with addiction treatment when compared to an alternative modality under controlled conditions.

The period of buprenorphine maintenance was relatively brief in this study because it was done within a research study context. The large majority of persons with heroin dependence in clinical practice would require a longer term of treatment. We believe the efficacy of NT in yielding diminished secondary opioid abuse would bear out in a longer term of maintenance, though further investigation of the NT approach in comparison to other modalities merits consideration.

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