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Progress and compliance in alcohol abuse treatment

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ABSTRACT

Improving patient compliance with physicians' treatment or prescription recommendations is an important goal in medical practice. We examine the relationship between treatment progress and patient compliance. We hypothesize that patients balance expected benefits and costs during a treatment episode when deciding on compliance; a patient is more likely to comply if doing so results in an expected gain in health benefit. We use a unique data set of outpatient alcohol abuse treatment to identify a relationship between treatment progress and compliance. Treatment progress is measured by the clinician's comments after each attended visit. Compliance is measured by a client attending a scheduled appointment, and continuing with treatment. We find that a patient who is making progress is less likely to drop out of treatment. We find no evidence that treatment progress raises the likelihood of a patient attending the next scheduled visit. Our results are robust to unobserved patient heterogeneity.

1. Introduction

There has been an increase in the interest in patient compliance in the past two decades (Trostle, 1997; Bloom, 2001; Wosinska, 2005).[1] In general, compliance is defined as following or adhering to medical advice.[2] Clinicians generally agree that patient compliance is an integral part of effective medical care, but the degree of compliance is low. Patients frequently do not take prescribed medicines, do not keep office appointments, do not follow through with treatment programs, and do not adjust lifestyles according to medical conditions. Begg (1984) reports 6–20% of patients do not even redeem their prescriptions. Smith and Yawn (1994) document that 19–28% of appointments are cancelled or missed, while Sellers et al. (1979) laments that 70% of clients in behavioral programs (such as substance abuse or diet control) fail to complete the programs. Noncompliance has been reported across many diseases.[3]

Failure to comply implies the absence of key inputs in health production (Keller et al., 1982; Ellickson et al., 1999). In addition, noncompliance may necessitate more expensive treatment later.[4] Noncompliance also may lead to medical errors because physicians may be misinformed about patients' behaviors (see Melnikow and Kiefe, 1994). The evidence suggests that lack of compliance leads to negative health outcomes and higher healthcare costs. In one study, noncompliance is claimed to lead to 125,000 premature deaths each year in the United States (Loden and Schooler, 2000). The cost of noncompliance in the U.S. due to hospital re-admissions and lost productivity has been estimated at around $100 billion a year (National Pharmaceutical Council, 1992; Johnson and Bootman, 1995).

Clearly, understanding *why* patients do not comply is important. Many have viewed noncompliance as resulting from patients' irrational behavior (Haynes, 1979b; Trostle, 1997). Increasingly,

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[1] More than six thousand citations since 1980 were found in Medline related to compliance (Bloom, 2001).

[2] The terms compliance and adherence are often used interchangeably in the literature. For detailed discussions on the historical use of these two terms, see Hughes et al. (1997).

[3] Noncompliance has been reported in about 36% of individuals with hypertension (Dunbar-Jacob et al., 2000), 18–70% in depression treatment (Engstrom, 1991), 40–50% for clients with schizophrenia (Curson et al., 1985; Buchanan, 1992), and 15–43% among patients with organ transplants (Didlake et al., 1988; Schweizer et al., 1990).

[4] Collins et al. (1990) indicates that "compliance. . .might reduce stroke risks by about one half and coronary heart disease by about one fifth within a few years". Ghali et al. (1988) found that more than one third of hospital re-admissions for heart failures are due to noncompliance with dietary and medication regimens.

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however, studies have turned attention to more objective factors, such as treatment complexity, side effects, and physician–patient interactions (Haynes, 1979b; Conrad, 1985). A more balanced approach regards patient compliance as the client's decision in light of the benefits and costs of continued treatment.[5]

Which factors influence a patient's compliance? Perhaps surprisingly, common demographic variables (e.g. gender income, age, etc.) have not been linked to compliance (Royal Pharmaceutical Society of Great Britain, 1998; Agar et al., 2005; Vik et al., 2004). On the other hand, treatment complexity, number of medications or duration of therapeutic regimens, and treatment cost-sharing have been found to be associated with compliance (Conrad, 1985; Cramer et al., 1989; Miura et al., 2000; Dor and Encinosa, 2004). Other factors such as perceived side effects, perceived treatment benefits and effectiveness, as well as quality of patient–physician relationship have also been identified (Chan, 1984; Adams and Howe, 1993; Rietveld and Koomen, 2002; Spire et al., 2002; Cherubini et al., 2003; Horne et al., 2004; Kennedy et al., 2004; Sloan et al., 2004; Vik et al., 2004; Aikens et al., 2005; Day et al., 2005; Garcia Popa-Lisseanu et al., 2005).

We hypothesize that if a patient perceives good progress and expects benefits, he is more likely to comply. This is a natural hypothesis from the standpoint of a patient's costs and benefits. If a patient has been making good progress during a treatment episode, it seems reasonable to expect him to continue. To test this hypothesis, we study office visits for alcohol problems. Compliance is measured by keeping scheduled visits and continuing with treatment. Our progress variables are whether a client's drinking problem has improved or whether there has been a relapse since the previous visit, as reported by clinicians and patients.

We use the intertemporal structure in our data to identify the causal effect of treatment progress on compliance. We use treatment progress in an on-going treatment episode to explain compliance in a *future* visit.[6] This allows us to test whether good progress in the past predicts compliance in the future. As far as we know, this is the first attempt to draw a causal relationship between treatment progress and compliance in alcohol outpatient treatments.

We control for a number of patient covariates in our study. Substantial research, starting with Haynes (1979a,b), demonstrates the importance of patient's knowledge of therapeutic regimes, interactions between patients and doctors, as well as motivation. Other papers have stressed the importance of patients' medical knowledge by comparing compliance between clients with and without educational training about therapeutic regimes (Weintraub et al., 1973; Brown et al., 1987; Seltzer et al., 1980; Ley and Llewellyn, 1995). Patient characteristics and previous experiences of alcohol abuse treatment will capture these effects. Finally, we control for unobserved heterogeneity of patients using random-effect, fixed-effect, and finite-mixture models (Heckman and Singer, 1984; Cutler, 1995).

Our results show that treatment progress affects patient compliance: a relapse in the previous visit increases the chance of dropping out of treatment, while making progress reduces it. On average, a relapse into drinking increases the chance of dropping out of a treatment program by about 9.0%, while making progress reduces it by 2.7%. These magnitudes are small but statistically significant. The results are robust when unobserved client heterogeneity is controlled for. Nevertheless, we do not find evidence that lack of progress or relapse in an earlier visit reduces the chance of missing the next scheduled visit for clients who stay in the program. Perhaps the decision regarding an upcoming visit is more likely subject to factors we do not observe, but the decision to remain in treatment is subject to systematic influence of progress in therapy.

The rest of the paper is organized as follows. Section 2 describes the data, defines measures of patient compliance and treatment progress, and presents summary statistics. Section 3 outlines the estimation strategy. Section 4 presents our main findings and robustness checks. We draw some conclusions and discuss future research in Section 5.

2. The data

Our data come from alcohol abuse outpatient treatment programs in the state of Maine. There are two sources. The first is the administrative records from the Maine Addiction Treatment System (MATS). MATS was maintained by the Office of Substance Abuse (OSA), an executive agency of Maine.[7] MATS collected information on clients enrolled in substance abuse programs that received funding from the federal government or the state of Maine between October 1, 1989 and June 30, 1995. Each client in the program was interviewed by a clinician or an assistant, and a standardized admission and discharge form was filled after the interview. If a client had not come for treatment for a long time, information from the clinical records of the client's last visit would be used for filling in the discharge form. The admission form recorded a client's demographics (age, race, sex, and education), living arrangements, household income, employment status, criminal involvement, history of substance abuse and treatment, as well as the frequency of alcohol use at admission. The discharge form recorded the provider and type of enrolled program (e.g.: inpatient or outpatient), the expected source of payment, the frequency of alcohol use at discharge, and the client's termination status.[8]

The second data source is a set of medical record abstracts of one thousand MATS episodes. In the summer of 1996, researchers at Boston University collected the data under the supervision of OSA representatives. We selected MATS records of alcohol abuse episodes. Furthermore, we selected clients with medium to high alcohol usage (more than once per month), and being treated on an outpatient basis, without prior inpatient treatment within a year, and from ten largest agencies. We then randomly sampled one hundred episodes from each agency. Their clinical records were obtained directly from these agencies. Finally, these records were linked to the administrative records in MATS through a parallel scrambling algorithm to maintain confidentiality (more details can be found in Lu and Ma, 2002). The analysis in the paper is based on the merged sample of about 1000 clients.

The medical record abstract data provide detailed information about each scheduled appointment in a treatment episode. Each client's treatment record contains the dates of each scheduled visit, the title of the responsible clinician, whether the appointment has been kept, and the reason why a client fails to attend an appointment. In addition, the clinical records include the clini-

[5] For instance, the health belief model stresses that a patient's compliance is determined by beliefs about treatment costs (both monetary and psychological), severity of illness, and health benefit in the future (Jank and Becker, 1984; Hughes et al., 1997).

[6] Our identification strategy is similar to "Granger-causality" in that we use past treatment progress to predict future patient compliance.

[7] The Department of Human Service was the responsible agency prior to the creation of OSA. OSA was created in July 1990 as a branch of the State's Executive Department. After July 1, 1996, OSA was transferred to the Department of Mental Health, Mental Retardation, and Substance Abuse Service. OSA was responsible for allocating state and federal funds for substance abuse, and for contracting with agencies that provided substance abuse services.

[8] For details on the data collection and variables of MATS, see Lu and Ma (2002), and Lien et al. (2004).