

# NEDS ANALYTIC SUMMARY

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## Highlights

**Proxies are often instructive but they cannot serve alone as accurate predictors of a client's substance use following treatment.**

## Analysis of Three Outcome Proxies for Post-treatment Substance Use in NTIES



### NEDS Analytic Summary Series

The Center for Substance Abuse Treatment (CSAT) works to improve the lives of those affected by alcohol and other substance abuse, and, through treatment, to reduce the ill effects of substance abuse on individuals, families, communities, and society at large. Thus, one important CSAT mission is to expand the knowledge about effective substance abuse treatment and recovery services. In support of these efforts, CSAT established the National Evaluation Data Services (NEDS) contract to provide a wide array of secondary data analysis products to the substance abuse treatment field.

Specifically, the NEDS project is focused upon providing CSAT with an analytic capability to use existing data to address policy- and practice-relevant topics as well as future research and evaluation activities. NEDS has developed several product lines designed to provide analytic findings to substance abuse treatment policy makers, service providers, services researchers and evaluators in a format that is most useful to the end user.

The Analytic Summary is one of the NEDS product lines. The purpose of the Analytic Summary is to provide a brief summary of each technical report produced by NEDS written in non-technical language. Readers who find the Analytic Summary results of interest can contact the original NEDS technical report authors for more detailed information. Through this process, the NEDS Analytic Summaries provide information to the substance abuse treatment field and promote linkages among different areas in the field.

### This Analytic Summary

This Analytic Summary is based on the NEDS Technical Report titled *Analysis of Three Outcome Proxies for Post-treatment Substance Use in NTIES* (Feidler, K., Screen, A., Greenfield, L., & Fountain, D. (2001). For a more thorough discussion of the analysis and findings, please obtain a copy of the complete Technical Report. Information for doing so is provided on the last page of this summary.

### Contents

Analytic Importance . . . . .	2
Analytic Approach . . . . .	2
Findings . . . . .	4
Implications . . . . .	8
Future Steps . . . . .	10



# Analysis of Three Outcome Proxies for Post-treatment Substance Use in NTIES

## Analytic Importance

One important function of CSAT is to expand the knowledge about, and the availability of, effective treatment and recovery services for those affected by alcohol and other substance abuse. In sponsoring these analyses of the data it has collected, CSAT is attempting to gain useful insight into the fundamental question: *What constitutes effective (and cost-effective) treatment, and for what populations?*

In response to rising demands for accountability, substance use treatment system managers use a variety of data-based indicators to monitor and report on treatment effectiveness, efficiency, and efficacy. Whenever possible, providers seek to obtain post-treatment outcome data that reveal the extent to which clients have achieved and sustained a healthier, substance-free life after they have left treatment. Follow-up data, which are collected at a specified interval after treatment has been completed, capture information regarding clients' substance use, criminal behavior, health, productivity, and family and social relationships.

When post-treatment data are not available, treatment system managers sometimes rely on intermediate data that are collected during treatment or at treatment exit. Intermediate data can be gleaned from a provider's administrative records and client-discharge interviews. Owing to the relative ease with which they are gathered, these intermediate data are sometimes used as proxies to gauge overall treatment success. It is not clear, however, how well these intermediate data (proxies) predict post-treatment substance use outcomes.

## Analytic Purpose

This analysis examined how well length of stay, treatment completion, and client satisfaction can serve as proxies for post-treatment substance use in the National Treatment Improvement Evaluation Study (NTIES). Specifically, it examined the relationship between the three proxies and substance-use outcomes 1 year after client discharge from treatment. Two key analytic questions were addressed:

- What are the relationships among length of stay, treatment completion, and client satisfaction at the client level?
- How well do length of stay, treatment completion, and client satisfaction predict post-treatment substance-use outcomes at both the client and service delivery unit (SDU) levels?

This analysis was designed to benefit practitioners and policy makers as well as researchers. It can help practitioners gain a better understanding of whether and how these three outcome proxies can be used to demonstrate program effectiveness. It can also provide policy makers with a better understanding of how to interpret data on proxies as budget- and program-planning decisions are made.

## Analytic Approach

### Data Sources

This analysis used client- and SDU-level information drawn from the National Treatment Improvement Evaluation Study (NTIES), a 5-year study to evaluate the effectiveness of comprehensive treatment services provided by CSAT sponsored demonstration projects. Data were collected at intake,

**This analysis focused on three proxies:**

- **Length of stay**
- **Treatment completion**
- **Client satisfaction.**

**Two analytic questions were addressed:**

- **How do these three proxies relate to one another at the client level?**
- **How well can they predict post-treatment substance use?**



**Relationships among the proxies were examined at the client level and the service delivery unit (SDU) level.**

## Analysis of Three Outcome Proxies for Post-treatment Substance Use in NTIES (cont.)

treatment exit, and at post-treatment follow-up from a total of 4,411 clients. The final sample size for this analysis was 3,205 clients in 59 SDUs. Missing or invalid data resulted in the reduction of sample size for some analyses. The most limited sample size included 2,547 clients, or about 80 percent of the final sample size.

Four treatment modalities were represented among the 59 SDUs in the analysis: (1) methadone outpatient, (2) non-methadone outpatient, (3) short-term residential, and (4) long-term residential.

For purposes of this analysis, the three outcomes proxies were defined as follows:

- **Length of stay (LOS):** A client's duration of treatment. ("Longer" LOS was treatment duration in the top one-third of all clients in a particular modality. "Shorter" LOS was treatment duration in the lower two-thirds of all clients in that modality.)
- **Treatment completion:** Client treatment that was considered by the provider as having been completed.
- **Client satisfaction:** A client's report that treatment had been either helpful, somewhat helpful, or not at all helpful. For this analysis, satisfaction was turned into a dichotomous variable in which clients were either very satisfied or not very satisfied.

In the final analysis sample of 3,205 clients, LOS was available for all clients. Treatment completion status was missing or not reported for 30 clients. Client satisfaction was missing or not reported for 635 clients.

### Analytic Strategies

The analysis employed a variety of statistical methods in addressing the two key questions. Relationships among the three proxies were identified through simple cross-tabulation analysis. More complex methods, such as hierarchical linear modeling (HLM) and bivariate analysis, were used to describe the relationship between the proxies and substance use outcomes.

At the client level, the first step in the analysis was to determine whether the proxies were generally associated with improved outcomes. The second step was to assess the accuracy of each proxy in predicting post-treatment outcomes for any given client.

At the SDU level, the proportion of clients with positive proxies was compared to the proportion of clients with positive outcomes (abstinence) for each of the 59 providers in the analysis.

To establish how well the three proxies can serve as predictors of post-treatment substance use, the most rigorous outcome criterion was applied: Did a given client have any use of any substance (drugs or alcohol) during the 30 days immediately prior to his or her follow-up interview?

Several variables were used as controls in testing the predictive strength of the proxies, including modality, pre-treatment maximum substance use, age, race/ethnicity, and gender. Other SDU and client level variables were included in the analyses to ensure that the proxies were not reflecting one or more other, perhaps more powerful, variables.



## Analysis of Three Outcome Proxies for Post-treatment Substance Use in NTIES (cont.)

### Findings

The analysis succeeded in extracting pertinent data regarding the two key issues addressed in this study: (1) relationships among treatment completion, client satisfaction, and LOS; and (2) the relationship between these three proxies and substance use outcomes on both the individual client and SDU levels.

### Relationships Among the Three Proxies

Overall, only 7 percent of clients had comparatively long LOS, had completed treatment, and were very satisfied. Conversely, 20 percent were not in the longer LOS group, had not completed treatment, and were somewhat or not at all satisfied. The majority of clients (63%) had two proxies in common.

**Relationships between individual proxies.** The analysis revealed the following relationships between the individual proxies.

- Clients in the longer LOS group were only slightly more likely to complete treatment than were those in the shorter LOS group. Nearly two-thirds (63%) of clients in both the longer and shorter LOS groups, however, failed to complete treatment.

- More clients who remained in treatment the longest were highly satisfied with treatment than were those in the shorter LOS group.
- More than 80 percent of those who completed treatment reported high satisfaction.

**Relationships among all three proxies.** For the 2,547 clients with valid, non-missing data on LOS, treatment completion, and satisfaction, clear associations among the three proxies were apparent:

- A high level of treatment satisfaction was strongly related to the likelihood that clients completed treatment, regardless of LOS.
- More of the very satisfied clients in the shorter LOS group completed treatment than in the longer LOS group.
- More of the less satisfied clients in the longer LOS group completed treatment than in the shorter LOS group.
- Clients who had a shorter LOS were least likely to complete treatment.

**The proportion of clients with positive proxies varied by modality.** The analysis revealed significant differences in clients' proxy status depending on modality (Exhibit 1).

The proxies were closely interrelated:

- More of the clients with longer LOS completed treatment than clients with shorter LOS.
- More clients with longer LOS were satisfied with their treatment
- More than 80 percent of treatment completers reported high satisfaction.



Outcome Proxy	Methadone Outpatient (n=257)	Non-methadone Outpatient (n=1,365)	Short-term Residential (n=807)	Long-term Residential (n=776)
Longer LOS	35%	34%	51%	34%
Completed treatment	12%	22%	70%	36%
Satisfied with treatment	31%	55%	81%	58%

## Analysis of Three Outcome Proxies for Post-treatment Substance Use in NTIES (cont.)

**Compared to clients in other modalities, a greater proportion of short-term residential clients:**

- Stayed in treatment longer
- Completed treatment
- Were satisfied with their treatment.

**Methadone clients had lower completion rates and lower satisfaction with treatment.**



- Short-term residential clients stayed in treatment longer. Due to the fact that a large number of clients in short-term residential treatment had a length of stay of 28 days, about half of the clients were in the longer LOS group, compared to about a third of clients in the other modalities.
- A greater portion of short-term residential clients completed treatment (70%), compared with clients in the other modalities (36% and less). This is not surprising since the duration of treatment in this modality is shorter than in other modalities.
- More short-term residential clients were very satisfied with their treatment (81%, compared with 58% of long-term residential clients, 55% of non-methadone outpatient clients, and 31% of methadone clients).

Compared to clients in the other modalities, clients in the methadone modality had the lowest treatment completion rates and the smallest proportion of very satisfied clients.

### Client-Level Relationship Between Proxies and Outcomes

In assessing the predictive strength of the proxies on the client level, the analysis examined them in much the same way that a provider or policy maker might,

e.g., by the extent to which each proxy was directly associated with a client's total abstinence from substance use after treatment. In this analysis abstinence was based on clients' reports of substance use in the past 30 days at the follow-up interview approximately 12 months after treatment exit.

**More clients with longer LOS were abstinent at follow-up.** Treatment duration has traditionally been regarded as an important predictor of outcomes. This analysis added to prior research showing that those who were in treatment longer were also more likely to be abstinent at follow-up (Exhibit 2). However, clients with shorter LOS also had high abstinence rates (57%).

When examined by modality, methadone clients appear to differ from clients in the other three modalities. Whereas approximately two-thirds of clients with longer LOS in the other modalities were abstinent at follow-up, only about one-third of clients with longer LOS in the methadone modality were abstinent.

In general, the analysis suggests that length of stay is an imprecise proxy for post-treatment outcomes.

**Treatment completers had higher abstinence rates than non-completers.** Similar to length of stay, the predictive strength of treatment completion appears

Exhibit 2		
Relationship Between Length of Stay and Substance Use at Follow-up		
Substance Use	Longer LOS % (n)	Shorter LOS % (n)
No use in past 30 days	65 (803)	57 (1,128)
Some use in past 30 days	35 (429)	43 (845)
Total	100 (1,232)	100 (1,973)

**Comparisons of proxies and outcomes at the client level showed:**

- **More of the clients who were in treatment longer were abstinent at follow-up than clients with shorter LOS**
- **About two-thirds of clients who completed treatment were abstinent at follow-up**
- **Over two-thirds of very satisfied clients were abstinent at follow-up.**



## Analysis of Three Outcome Proxies for Post-treatment Substance Use in NTIES (cont.)

to vary depending on modality. Overall, clients who completed treatment were more likely to be abstinent (Exhibit 3). However, among methadone clients, those who did not complete treatment were more likely to be abstinent than those who did complete treatment (31% and 24%, respectively).

In addition, more than 60 percent of both completers and noncompleters in non-methadone modalities were abstinent at follow-up. The analysis thus revealed that treatment completion, like length of stay, is an imprecise predictor of post-treatment substance use.

**Over two-thirds of the very satisfied clients were abstinent at follow-up.** Overall, 67 percent of very satisfied clients reported no substance use in the past 30 days at the 12-month follow-up (see Exhibit 4). Again, the data varied when analyzed by modality. For example, very satisfied methadone clients were less likely to be abstinent than very satisfied clients in the other modalities.

Like length of stay and treatment completion, client satisfaction appears to be limited as a proxy for post-treatment outcomes. Not all highly satisfied clients were abstinent at follow-up, and not all less satisfied clients were using drugs or alcohol at follow-up. Within

the three non-methadone modalities, for example, at least 55 percent of those who were not very satisfied were nonetheless abstinent at follow-up.

The client-level analysis indicated a generally positive relationship between post-treatment abstinence and all three proxies—length of stay, treatment completion, and client satisfaction. The analysis also revealed, however, that all three proxies are imperfect predictors of post-treatment substance use outcomes on a client-by-client basis.

### SDU-Level Relationship Between Proxies and Outcomes

In providing performance data to funding or regulatory agencies, substance abuse treatment providers often report on length of stay, treatment completion, and client satisfaction. For this analysis, each of the three proxies was compared with the average proportion of abstinent clients for each of the 59 SDUs in the study. The analysis employed simple comparisons of the percentage differences between positive proxies and outcomes (abstinence).

- The proportion of clients with longer length of stay bore little or no relationship to the proportion of abstinent clients within an SDU.

Exhibit 3		
Relationship Between Treatment Completion and Substance Use at Follow-up		
Substance Use	Completed Treatment % (n)	Did Not Complete % (n)
No use in past 30 days	65 (765)	57 (1,150)
Some use in past 30 days	35 (404)	43 (856)
Total	100 (1,169)	100 (2,006)

## Analysis of Three Outcome Proxies for Post-treatment Substance Use in NTIES (cont.)

**At the SDU level, the proportions of clients with positive proxies were substantially different from the proportions of clients who were abstinent.**

**More rigorous statistical analyses found client satisfaction to be a significant predictor of post-treatment substance use.**



Exhibit 4 Relationship Between Satisfaction and Substance Use at Follow-up		
Substance Use	Very Satisfied % (n)	Not Very Satisfied % (n)
No use in past 30 days	67 (1,040)	51 (518)
Some use in past 30 days	33 (514)	49 (498)
Total	100 (1,554)	100 (1,016)

- There was no significant relationship between the proportion of clients who completed treatment and the proportion of clients who were abstinent at follow-up.
- There was a positive but largely insignificant relationship between satisfaction and abstinence at follow-up.

The variability in the client satisfaction proxy was striking. In one SDU, 100 percent of the clients were abstinent, but none were very satisfied. In another SDU, only 50 percent were abstinent, but 100 percent were very satisfied. In general, however, the proportion of clients who were abstinent at follow-up was similar to the proportion who were very satisfied with treatment.

Overall, the proportions of clients with positive proxy status (i.e., longer LOS, completed treatment, or very high client satisfaction) were substantially different from the proportions of clients with positive post-treatment outcomes. While it is true that SDUs with a greater proportion of very satisfied clients often had higher rates of abstinence, this was not the case with LOS or treatment completion.

Based on the results of the SDU-level analysis, judgments regarding provider performance that rely solely on the three proxies may not fully reflect actual provider performance.

### Use of Proxies to Predict Post-Treatment Substance Use

Statistical models that incorporated a combination of client- and SDU-level data were required to predict substance use at follow-up. The Hierarchical Linear Modeling (HLM) technique was used to determine if the proxies were significant predictors of substance use outcomes after controlling for demographics, treatment setting and additional treatment-related variables.

- For clients who were very satisfied with treatment, the odds of abstaining from post-treatment substance use was 75 percent greater than the odds for clients who were not highly satisfied.
- For clients who completed treatment, the odds of abstaining from substance use at follow-up was 46 percent greater than for clients who did not complete treatment.
- The client's length of stay in treatment was not a significant predictor of post-treatment abstinence.

The HLM technique was also used on two specific modalities for which there was a sufficient number of SDUs: Non-methadone outpatient and long-term residential.

### Implications for research include:

- **Increase efforts to collect post-treatment follow-up data from clients.**
- **Identify additional proxies that might be useful in evaluating treatment success.**
- **Integrate data from sources other than drug treatment systems.**
- **Develop research plans in partnership with treatment providers.**



## Analysis of Three Outcome Proxies for Post-treatment Substance Use in NTIES (cont.)

- For clients in non-methadone outpatient treatment, satisfaction was a significant predictor of post-treatment substance use, as was pre-treatment maximum use.
- For clients in long-term residential treatment, satisfaction, as well as pre-treatment maximum use and duration of the follow-up period, were significant predictors of substance use outcomes.
- **Examine other proxies.** Data on proxies are typically less costly and more expedient to collect than are data on long-term outcomes. It would therefore be beneficial to test other more comprehensive measures of client satisfaction as well as additional proxies to be used in relation to post-treatment substance use.
- **Examine other substance use outcomes.** This analysis examined the relationship between three proxies and only one outcome—post-treatment abstinence. Post-treatment abstinence is a very restrictive outcome, which could mask the ability of the proxies to predict other measures of substance use at follow-up. Proxies should therefore be tested against other substance use outcomes.

The HLM results suggest that one of the three proxies, satisfaction, is a significant predictor of substance use at follow-up. Treatment completion was significant in the general model, but not in the modality specific models.

### Implications

This analysis showed that there is an association among the three proxies tested. For example, clients who were in treatment longer or who completed treatment were more satisfied with their treatment than other clients. More clients who had a shorter LOS left treatment prior to completion, and high satisfaction was associated with treatment completion regardless of LOS.

How well did these proxies predict post-treatment substance use? Although the analysis supports the value of collecting outcome proxies in general, the intermediate data addressed in this analysis, by themselves, are not sufficient. Follow-up data clearly remain the best source of significant information regarding the impact of treatment.

### **Implications for Research**

Outcome proxies can be useful to collect, but they should neither be collected nor interpreted in isolation as indicators of treatment effectiveness. Specific implications for research include the following:

- **Examine outcomes in other domains.** In addition to substance use outcomes, future research might benefit from the integration of data from other systems, such as criminal justice, labor, and vital statistics.
- **Examine other potentially explanatory variables.** Future analyses could consider the impact on treatment outcomes of such client- and SDU-level variables as client-to-staff ratios, revenues per client, and amount of time spent in counseling.
- **Integrate post-treatment follow-up studies with regular outcome monitoring systems.** Proxies such as length of stay and client satisfaction were imperfect predictors of post-treatment substance use in this analysis. Researchers should therefore continue to collect long-term post-treatment follow-up data from clients to determine treatment impact.

**Implications for policy include:**

- **Ensure adequate funding for collection of outcome data**
- **Strengthen data collection on the state level.**

**Implications for practice include:**

- **Monitor the relationship between treatment and client satisfaction**
- **Utilize both intermediate and outcome data to support funding for expansion of services.**



## Analysis of Three Outcome Proxies for Post-treatment Substance Use in NTIES (cont.)

- **Calibrate proxy data with adjustments to post-treatment results.** For example, if results show that women have worse outcomes than men, estimates of program performance could be adjusted to reflect that some providers have more clients who are women than men.

Where possible, investigators should develop research plans in partnership with providers in order to ensure that the results will be applicable to practitioners.

### Implications for Policy

The analysis indicated a relationship between an individual client's length of stay and satisfaction with treatment, and that this relationship varied greatly from one SDU to another. Specific implications for policy include:

- **Remain cautious about using intermediate data in lieu of post-treatment follow-up data.** Proxies may provide some insight into provider performance, but they do not provide a complete picture. Proxies should be examined in conjunction with other client and SDU data.
- **Provide adequate support to providers and researchers in their efforts to collect outcome data.** Many providers have neither the budget nor the staff to conduct evaluation activities. Providers need financial support and technical assistance to effectively measure treatment outcomes.
- **Strengthen data collection in the treatment system at the State level.** In order to more fully document substance use treatment outcomes, individual States should continue to work with providers to collect client-outcome data.

- **Support policies that enhance collaboration between the research and the treatment communities.** Treatment professionals should be included in the early-stage development of specific research projects. They also should be included early in the development of comprehensive research plans at the local, State, and Federal levels.

Long-term follow-up evaluation provides the most accurate information about treatment outcomes, but this type of data is expensive, time-consuming, and labor intensive to obtain. Further work is needed to examine a wide range of intermediate data for use in evaluating post-treatment outcomes.

### Implications for Practice

In each phase of this analysis, client satisfaction appeared to be an indicator of post-treatment substance use.

Treatment providers therefore may want to expand their efforts to collect data on client satisfaction in conjunction with other outcome data during treatment as well as at the completion of treatment. Specific implications for practice include:

- **Monitor the relationship between treatment services and client satisfaction.** Attempt to identify the factors that are likely to result in satisfaction as well as the factors that could result in the lack of satisfaction.
- **Explore strategies in practice that may lead to greater client satisfaction, longer LOS, and treatment completion.** Providers can make use of both intermediate and post-treatment data in determining whether innovative strategies are succeeding.

## Analysis of Three Outcome Proxies for Post-treatment Substance Use in NTIES (cont.)

In addition to enhancing internal improvement efforts, outcome data provide concrete evidence of treatment effectiveness.

### **Future Steps**

Accountability is increasingly important on the Federal, State, and local levels. Although some proxies can provide limited information on treatment outcomes, they are not adequate substitutes for follow-up data. Until adequate proxies are identified, follow-up data must be collected in order to determine the long-term impact of substance use treatment.

Follow-up data collected at a specified interval after treatment provide the strongest evidence of treatment effectiveness. Unfortunately, these data are frequently difficult to obtain due to time and resource constraints.

Without adequate financial and staff resources providers often rely on such proxies as length of stay, treatment

completion, and client satisfaction as indicators of treatment effectiveness. While by no means dismissing the value of these proxies, in this analysis they appeared to be of little value in accurately predicting post-treatment outcomes.

Further research and analysis should be conducted regarding the ability of these and other proxies to predict treatment outcomes. This analysis served to underscore the urgent need for providers and researchers to be supported in their efforts to collect post-treatment follow-up data for which no proxy can serve as an adequate substitute.

### **Reference**

Feidler, K., Screen, A., Greenfield, L., & Fountain, D. (2001). *Analysis of three outcome proxies for post-treatment substance use in NTIES*. Report to the Center for Substance Abuse Treatment. Fairfax, VA: Caliber Associates.

*For more information, please contact the National Evaluation Data Services analysis team at (703) 385-3200, or visit the NEDS Web site.*

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## **National Treatment Improvement Evaluation Study (NTIES)**

This analysis was performed on data derived from the National Treatment Improvement Evaluation Study (NTIES). The NTIES was a national treatment services evaluation of the effectiveness of substance abuse treatment services delivered in comprehensive treatment demonstration programs supported by the Center for Substance Abuse Treatment (CSAT).

The NTIES project collected longitudinal data between FY 1992 and FY 1995 on a purposive sample of clients in treatment programs receiving demonstration grant funding from CSAT. Data are derived from client interviews conducted at three points in time: at treatment intake, at treatment exit, and 12 months after treatment exit.

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