



American Addiction Centers Outcomes Study

12 month post discharge outcomes among a
randomly selected sample of residential
addiction treatment clients

Centerstone Research Institute

2018

Purpose of this Paper

Addiction and addiction treatment is multi-faceted, impacting many areas of a person's life, including performance at work, relationships with loved ones, and mental and emotional well-being. Understanding people on the journey to recovery is similarly complex, and cannot be reduced to whether a person is abstinent or has used substances post-treatment. American Addiction Centers (AAC) approaches treatment and recovery from a holistic perspective, supporting clients to build the quality of life they want in all domains. In line with this broader view of recovery, AAC partnered with Centerstone Research Institute (CRI), an independent non-profit research organization, to build an embedded evaluation system that systematically collected outcomes data at intake, discharge, and post-discharge to understand how clients were doing up to one year after treatment. The intention of this project was to develop an ongoing outcome monitoring system embedded in the daily clinical work flows for all staff. Information from an outcomes evaluation such as this one helps addiction treatment leadership and staff understand the challenges and successes clients face when they leave treatment and the extent to which clients maintain the progress they make during treatment up to one year post-discharge. Findings from the project can be used to target interventions for clients most at risk for relapse, as well as develop more targeted post-discharge plans designed to address areas that need additional services or support (e.g. sober living, community support groups, recovery supports, etc.). AAC selected six facilities to participate in the evaluation project.

The ongoing outcome monitoring system provided a framework to collect outcome data across all clients at the participating facilities. Data were collected as part of the the intake and discharge interviews already conducted with each client. All clients were asked

Evaluation data show **statistically significant improvement** in key areas of functioning from **intake to discharge** and from **intake to 12 months post discharge**.

if CRI could contact them after they left AAC services to complete follow-up surveys 2 months post-discharge, 6 months post-discharge, and 12 months post discharge. Data collected through these follow ups showed statistically significant improvements in depression symptoms, family functioning, relapse risk, and recovery capital from intake to discharge. Additionally, clients experienced improvements in six out of the seven functional domains assessed by the Addiction Severity Index (ASI), a standardized assessment validated for outcomes measurement. The data from this monitoring system provided AAC leadership and operations staff with actionable information about what happens during and after treatment, and attempted to follow up with every client post-discharge.

As of March 3, 2017, the follow-up rate for the ongoing outcome monitoring system was 30%. While the follow up rate was relatively low, the number of follow ups was large due to the practice of reaching out to every client that discharged from a participating facility. To ensure that the follow up data collected through the ongoing outcome monitoring system was representative of the overall population, a sub-study with a stratified random sample was designed with a goal of a achieving a higher follow-up rate. The sub-study included four facilities and focused on outcomes from intake to 12 month post-discharge.

The sub-study was conducted using a randomly selected sample of 168 clients who were eligible for their 12 month follow-up. Of the 168 randomly selected, 93 clients completed the 12 month follow-up survey, for a follow-up rate of 55%. The sample included clients of all discharge types and included a

large variation in length of stay (insert range). In order to examine the impact of program completion of outcomes 12 months post discharge, only the 81 clients whose discharge type was “complete” were included in these analyses. This paper summarizes key outcomes from this sample of 81 randomly-selected clients twelve months after they completed residential treatment with AAC.

Treatment at AAC

AAC provides a variety of evidence-based treatments for those with substance use disorders, as well as co-occurring mental health disorders. The ASI serves as the biopsychosocial assessment for all AAC facilities. Treatment includes individual therapy, group sessions, and family therapy, utilizing a variety of therapeutic approaches such as motivational interviewing, cognitive behavioral therapy, and trauma counseling. Clients come to AAC from across the United States, and are matched to one of 19 AAC facilities based on their specific needs. All facilities use AAC’s holistic curriculum “Embracing Change: Recovery for Life.” The average length of stay in residential care is 30 days. Once a client completes treatment and discharges from services, they are connected with AAC’s alumni program which provides after-care support.

Methods

AAC utilizes the Addiction Severity Index (ASI), 5th edition with all clients who enter care at the participating facilities. AAC selected this assessment because it is a validated, reliable tool that assesses clients’ needs in seven key domains critical to overall quality of life and functioning. The ASI is well aligned with the primary treatment goals of improving client’s overall functioning, and serves as the foundation for developing a targeted treatment plan. Additionally, the ASI is a valid measure of change over time and treatment outcomes. The ASI includes seven domains: Medical, Education/Employment, Alcohol, Drug, Legal, Family/Social, and Psychiatric. Each domain returns a score allowing identification of the areas with greatest need and risk. The ASI can be administered several times to a client while maintaining validity.

To prepare AAC staff for the adoption of the ASI, CRI delivered intensive in-person evaluation training for staff at each facility to ensure fidelity in the administration and data entry of the ASI. All items included in the ASI were embedded into the electronic medical record and data collection was integrated into routine clinical workflows. Once a client arrived at a facility, their primary therapist completed the intake ASI with them within 48 hours. The evaluation study was explained to clients and they were given the opportunity to consent or decline to participate. While the intake and discharge ASI were part of the provision of care at AAC, participation in the follow up interviews was completely optional and declining to participate in no way impacted the care provided to clients. The discharge ASI was administered to clients by their primary therapist within one to two days of their discharge date.

All clients who consented to participate in the follow up evaluation were contacted two months, six months, and twelve months post discharge and asked to complete the follow up ASI. In order to collect the highest quality information despite the geographic footprint of AAC clients, all follow ups were collected via phone interviews with CRI’s trained data collectors. The follow up interview took between 20-30 minutes to complete and also provided validated scores for each of the domains. Clients were compensated for their time and participation with a gift card that was electronically sent to them within three days of completing the follow-up survey.

For this focused sub-study, clients who were discharged from Desert Hope, Greenhouse, and Recovery First and whose twelve month follow up window opened between February 6, 2017 and March 3, 2017 were included in the sampling frame. A total of 168 clients were randomly selected. In order to ensure that the distribution of facilities within the sample matched the overall population at AAC, the sample was stratified by facility. Eighty-three clients were selected from Desert Hope, 61 were selected from Greenhouse, and the remaining 24 were selected from Recovery First. CRI attempted to reach these 168 randomly selected clients for one month. Of the 168 selected, 93 clients completed the interview, for a follow up rate of 55%. Out of the 93 randomly selected clients who completed the 12 month interview, only the 81 clients who completed the AAC treatment program were included in the analysis presented in this paper.

Tracking and Follow Up Methods

In order to ensure a high follow up rate among these randomly selected clients, intensive tracking strategies were used. At intake, clients were given an information flyer explaining the project and a detailed locator form was completed by intake staff that included contact information for collateral contacts. At discharge, clients were again given a flyer to remind them of the project and the follow up time points, and the locator form was updated with any new or additional contact information. Reminder emails were sent to clients who consented to participate in the evaluation within a week of each data collection opening, and emails were sent after phone calls were made to clients with no answer. A personal letter was mailed to each of the 168 clients who were selected into the sample as well. For this sub-study, clients were called at every available phone number multiple times each week. Because the contact information provided at discharge was a year old, callers also used directories available online to locate updated phone numbers and email addresses for clients (Google, social media profiles, Spokeo, BeenVerified, PIPL). As a last resort, if viable contact information could still not be obtained, CRI worked with AAC's billing department to determine if there was any additional contacts.

An average of 10 phone calls, 4 emails, and 6 text messages, in addition to one mailed letter, were placed to each client in the sample over the course of the month, for an average of 20 total contact attempts. The range of total contact attempts was 1 attempt to 69 attempts.

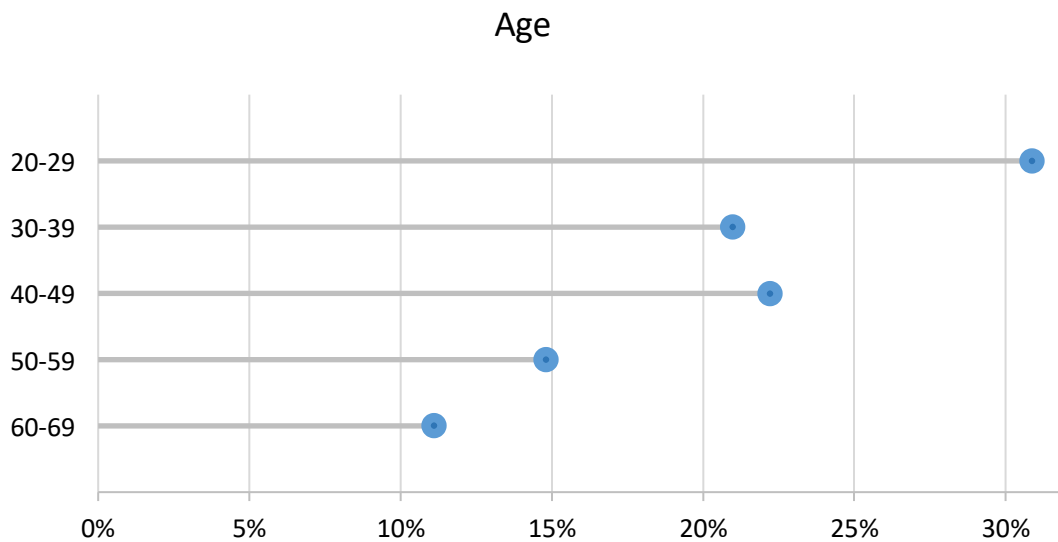
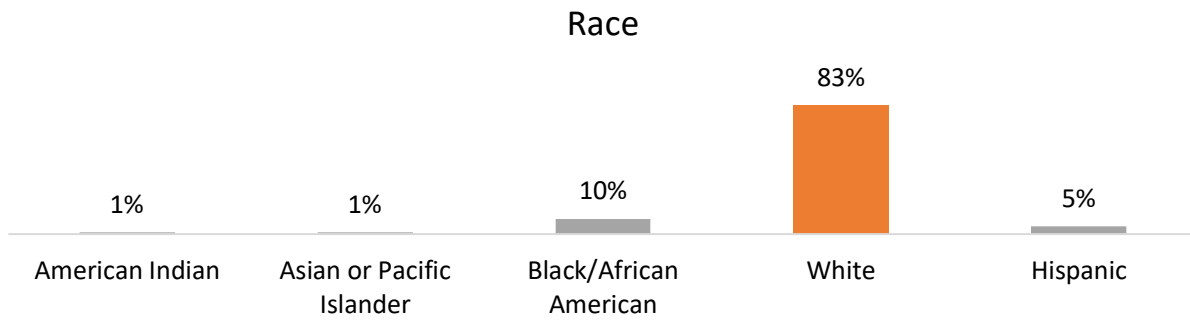
Characteristics of the 12 Month Random Sample

The demographics of the sample closely mirrored the demographics of the overall AAC population. Due to the stratified sampling strategy, the majority of the clients received treatment from Desert Hope, in line with the relative proportion of the overall AAC population that receive care at each facility annually. Although the sample was predominately male (63%), a slightly higher proportion of females completed the interview, as compared to the overall AAC population.

Gender



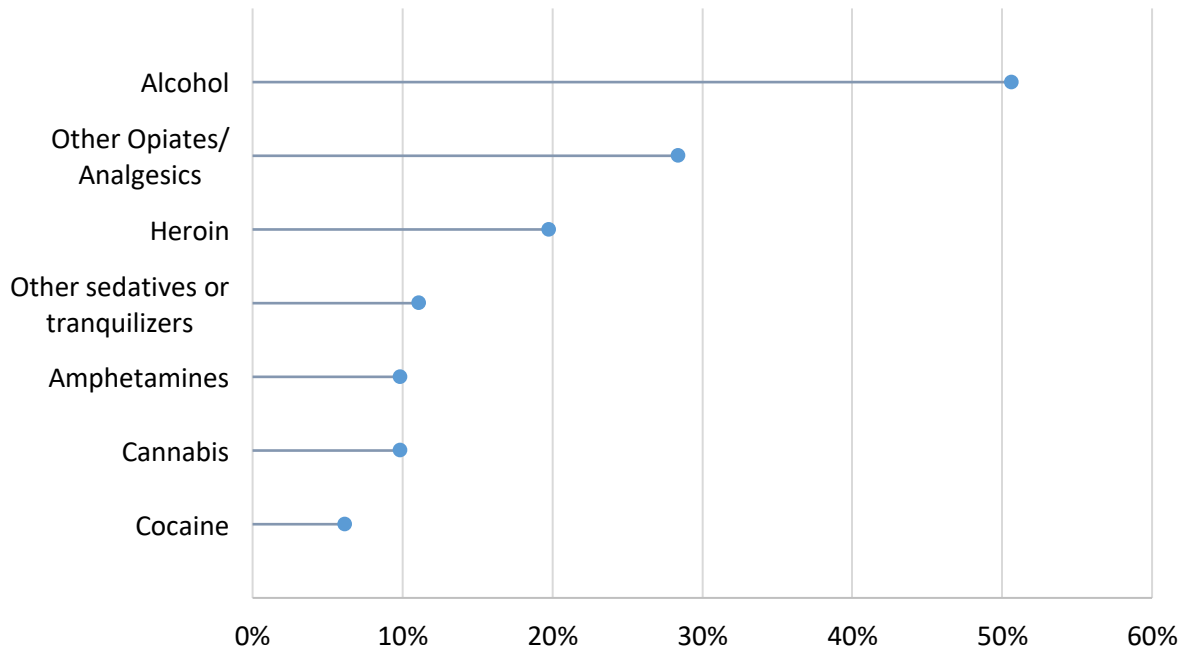
The vast majority of clients in the sample were white (83%), and identified as straight (91%). The largest age group was 20 to 29 years old.



Clients could report more than one substance as their problem substance. Just over half (n=41, 51%) of the clients in the sample reported that alcohol was a problem substance at intake. The next most common substances were other opiates (n=23, 28%) and heroin (n=16, 20%).

Average length of stay in the sample was 32 days, with a range of 27 to 56 days.

Problem Substances at Intake



12 Month Post Discharge Outcomes

Change over time in composite scores

The Addiction Severity Index (ASI) measures the severity of client's unmet needs in each domain, on a scale of 0 to 100¹. These scores are referred to as Composite Scores and have been validated as measures for change in severity over time. The average Composite Scores decreased from intake to 12 month follow up in all domains, reflecting improvement in that status of client's lives in each domain. The most dramatic decreases in severity were in the Alcohol domain, dropping from 43 to 5, followed by the Family domain, dropping from 39 to 5. The smallest decrease was in Employment. These decreases were statistically significant.

¹ ASI composite scores range from 0 to 1. For ease of interpretation, all scores were multiplied by 100 to transform them into whole numbers.

All scores on the ASI decreased from intake to 12 months post discharge

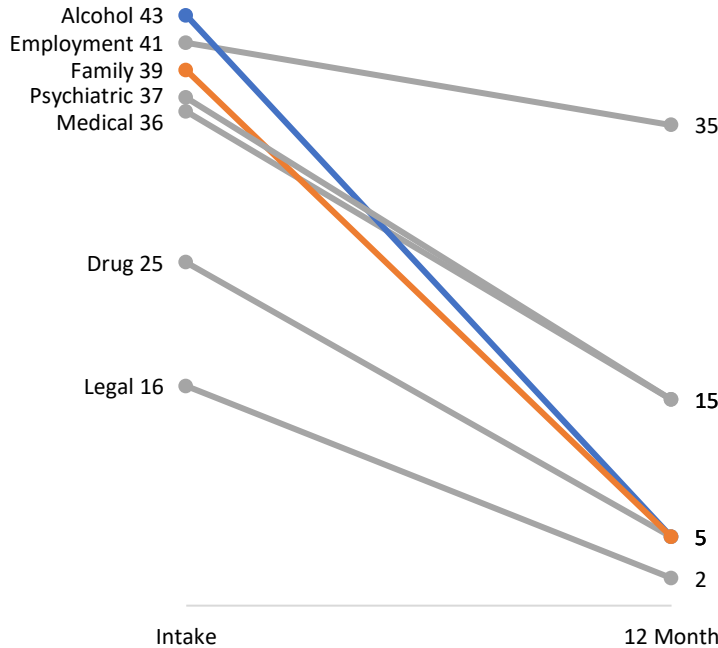


Table 1. ASI Composite Scores

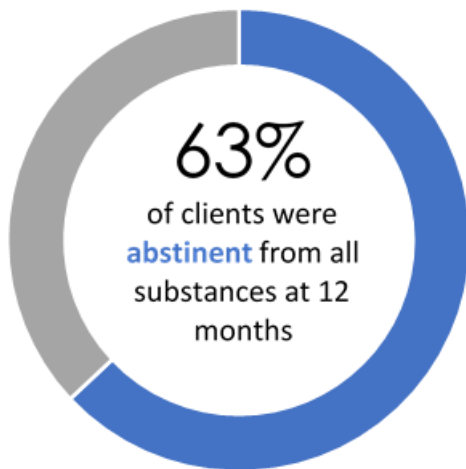
Random sample intake and 12-month follow-up differences

Items	<i>Intake</i>		<i>12 Month Follow-Up</i>		<i>t</i>	<i>p</i> -value	<i>n</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
Medical ASI Score	0.36	0.35	0.15	0.25	4.49	<.001***	77	0.58
Employment ASI Score	0.41	0.27	0.34	0.25	2.25	<.027*	75	0.45
Alcohol ASI Score	0.44	0.36	0.05	0.12	9.26	<.001***	75	0.52
Drug ASI Score	0.25	0.19	0.05	0.08	9.17	<.001***	76	0.41
Legal ASI Score	0.16	0.23	0.02	0.07	4.40	<.001***	58	2.55
Family ASI Score	0.39	0.24	0.04	0.98	12.82	<.001***	77	1.01
Psychiatric ASI Score	0.37	0.20	0.13	0.16	8.41	<.001***	69	0.53

Notes. Items have been rephrased for reporting purposes; see ASI for original item wordings. *M* = mean, *SD* = standard deviation, *t* = paired t-test, *n* = sample size, *d* = Cohen's *d* effect size. **p* ≤ .05. *** *p* ≤ .001. †Items range on scale of 1-5.

Substance Use at 12 Months

At the 12 month follow up, 48% (n=39) of clients reported that they had not abused any substances since leaving treatment, meaning that they had no slips or relapses since leaving AAC. Sixty-three percent (n=51) of clients had not used any substances in the past 30 days. Of the clients who reported that they had been using in the past 30 days, the majority reduced their use as compared to their patterns at intake.



Specifically, clients were asked how many days in the past 30 they used each substance. Among those who reported use in the 30 days prior to intake, the average number of days using each substance decreased from intake to 12 month. For those reporting any alcohol use at intake, the average number of days decreased from 15 to 3 days at the 12 month follow up. For those reporting any heroin or other opiate use at intake, the average number of days reduced from 24 days to 3 days and from 21 days to 1 day respectively.

Clients who reported they had used a substance in the 30 days prior to the twelve month follow up also saw a significant decrease in the average number of days of use, indicating harm reduction.

Additionally, clients were asked at intake and again at the 12 month follow up to rate their use in the past 30 days on a scale from heavy use (significantly hindering daily functioning), moderate use, light use, or no use. Eighty one percent shifted from a higher to a lower amount of use. Only two clients reported that they were admitted to a hospital for alcohol or drug related reasons in the 30 days prior to the 12 month follow up. No clients reported that they went to the emergency room for alcohol or drug related reasons.

Overall Use from Intake to Follow Up

Of those who reported using these substances at intake, the average number of days decreased significantly. Many of these clients reported they were not using these substances at all at 12 months.



Heroin use decreased by an average of **88%**

Other Opiate use decreased by an average of **95%**

Alcohol use decreased by an average of **80%**

Harm Reduction among those Still Using

The average number of days of use also decreased significantly for those who reported **they were still using** these substances at 12 months, indicating **harm reduction**



Heroin use decreased by an average of **18%**

Other Opiate use decreased by an average of **20%**

Alcohol use decreased by an average of **38%**

Alcohol Use

Three-quarters of the sample (75%, n=61) reported alcohol use in the 30 days prior to intake. At the 12 month follow up, only 26% (n=21) of the sample reported any alcohol use in the prior 30 days, representing a decrease of more than half. The average number of problem days decreased by 91%, from 12 days at intake to 1 day at the twelve month follow up. Clients were asked to rate how troubled or bothered they were by the alcohol problems they experienced in the previous 30 days, and over half of the sample (54%, n=44) reported that they were less troubled or bothered at the follow up as compared to their response at intake. An additional 40% (n=33) of clients reported that they were not at all bothered by alcohol problems at either the intake or follow up time point. Finally, the average amount of money clients spent on alcohol in the past 30 days decreased by 84% from intake to the follow up, from \$140 to \$22.



Alcohol problem days reduced from **12** to **1**, a **92%** decrease

Drug Use

Similar to the reduction in alcohol use, the proportion of clients who reported any drug use in the prior 30 days decreased from 74% (n=60) at intake to 26% (n=21) at the twelve month follow up. The average number of days clients' experienced drug related problems dropped 86%, from 14 days to 2 days. Fifty seven percent (n=46) of the clients reported a reduction in how troubled or bothered they were by drug related problems at the 12 month follow up, and an additional 35% (n=29) reported they were not at all bothered by any drug related problems at either intake or the follow up. The average amount of money spent on drugs in the prior 30 days decreased by 87%, from \$700 at intake to \$91 at the follow up.



Drug problem days reduced from **14** to **2**, an **82%** decrease

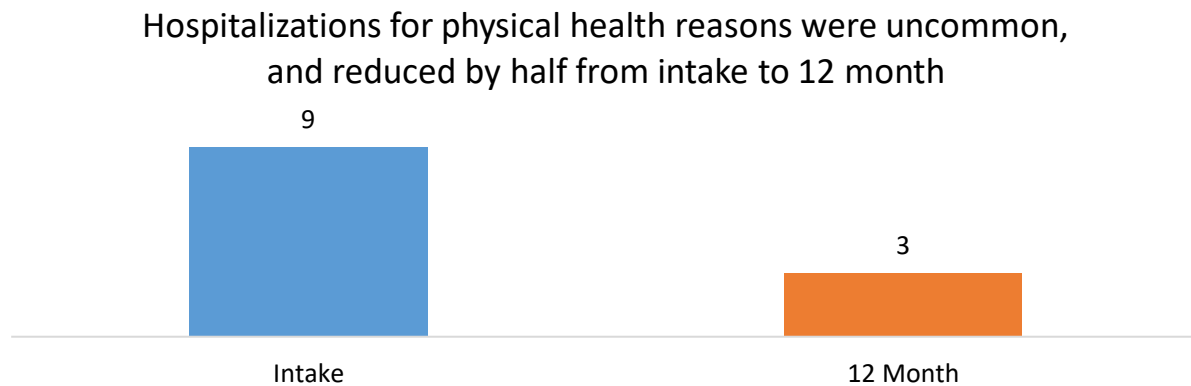
Table 2. Days of Substance Use in the Past 30
Random sample intake and 12-month follow-up differences

Items	Intake		12 Month Follow-Up		<i>t</i>	<i>p</i> -value	<i>n</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
Days With Substance Use in Past 30 Days	3.58	0.70	1.66	0.80	16.36	<.001***	79	2.55
Days Using Alcohol in Past 30 Days	11.46	11.63	2.13	5.86	7.12	<.001***	79	1.01
Days Using Heroin in Past 30 Days	5.23	11.01	0.88	3.74	3.98	.001***	80	0.53
Days Using Other Opiates in Past 30 Days	8.20	12.40	0.60	3.83	5.86	<.001***	80	0.83
Days Using Sedatives in Past 30 Days	5.05	9.87	0.78	3.07	4.08	<.001***	80	0.58
Days Using Cocaine in Past 30 Days	1.84	5.37	0.10	0.89	2.95	<.005*	80	0.45
Days Using Amphetamines in Past 30 Days	5.04	10.86	0.86	2.99	4.44	<.001***	80	0.52
Days Using Cannabis in Past 30 Days	6.75	11.69	2.66	7.67	2.85	.005*	79	0.41
Total Substance Use in Past 30 Days	45.78	31.63	8.24	16.21	10.17	<.001***	80	2.55
Days of Alcohol Problems in Past 30 Days	11.94	13.57	0.78	3.42	7.15	<.001***	77	1.01
Days of Drug Problems in Past 30 Days	13.71	13.95	2.20	7.10	7.41	<.001***	79	0.53

Notes. Items have been rephrased for reporting purposes; see ASI for original item wordings. *M* = mean, *SD* = standard deviation, *t* = paired t-test, *n* = sample size, *d* = Cohen’s *d* effect size. **p* ≤ .05. *** *p* ≤ .001. †Items range on scale of 1-5.

Physical Health at 12 Months

Very few clients reported hospitalizations for physical health reasons. Nine clients (11%) reported one hospitalization for physical health reasons in the 30 days prior to admission, and only 3 clients (5%) reported one hospitalization in the 30 days prior to the twelve month interview.



At the 12 month follow up, clients were asked if they had gone to the emergency room for any reason in the previous 30 days. Only 4 clients reported they went to the emergency room in the past 30 days, all for physical health reasons.



Medical problem days reduced from **9** to **5**, a **44%** decrease

The average number of days that clients experienced physical medical problems decreased from 9 at intake to 5 at the follow up. Forty-four percent (n=36) reported that they were less troubled or bothered by medical problems at the follow up, and 30% (n=24) reported they were not at all bothered by medical problems.

Percentage of Clients Reporting Mental Health Symptoms in the past 30 days

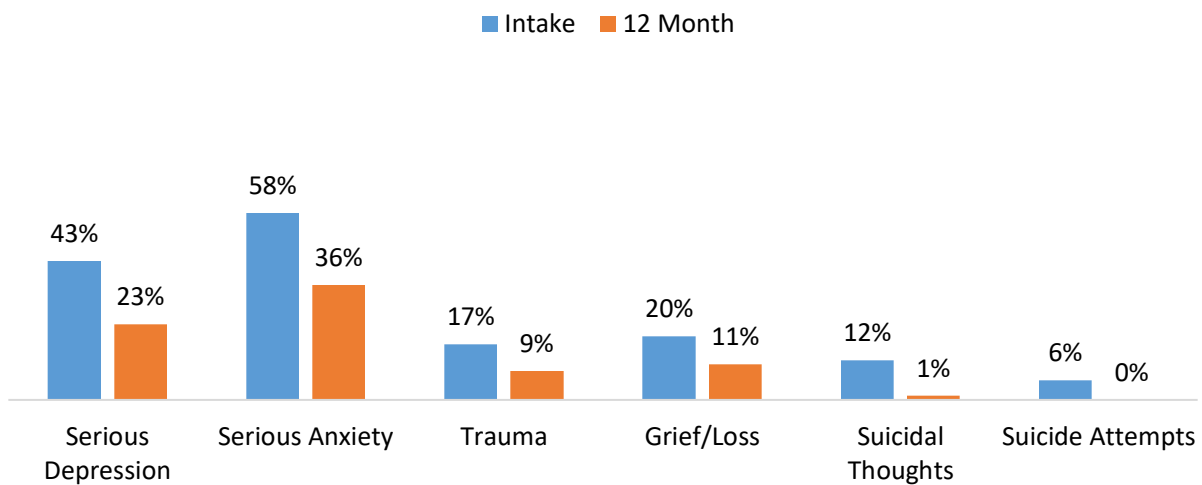


Table 3. Physical Health Outcomes

Random sample intake and 12-month follow-up differences

Items	Intake		12 Month Follow-Up		<i>t</i>	<i>p</i> -value	<i>n</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
Days Experienced Medical Problems in Past 30 Days	8.92	12.45	4.68	2.65	1.85	.010*	78	0.47
Degree Troubled By Medical Problems in Past 30 Days [†]	2.48	1.31	1.78	1.26	3.21	.004*	80	0.54

Notes. Items have been rephrased for reporting purposes; see ASI for original item wordings. *M* = mean, *SD* = standard deviation, *t* = paired t-test, *n* = sample size, *d* = Cohen's *d* effect size. **p* ≤ .05. *** *p* ≤ .001. [†]Items range on scale of 1-5.

Mental and Emotional Health at 12 Months

AAC provides treatment for co-occurring substance use and mental health disorders. At intake, 31% of the sample (n=25) reported that they had been treated in an inpatient or hospital setting for psychiatric needs at least one time in their lives. A slightly higher proportion of clients reported that they had received outpatient treatment for psychiatric needs at least one time in their lives (43%, n=35).

All clients regardless of psychiatric history were asked at intake and the twelve month follow up if they had experienced any of a series of mental health symptoms in the previous 30 days. The most

commonly reported symptoms were serious anxiety and serious depression. At the 12 month follow up, the proportions of clients experiencing each mental health symptoms dropped.

Clients were then asked how many days in the past 30 they experienced any of the mental health symptoms they reported. The average number of days decreased from 16 days at intake to 7 days at the follow up. Nearly three-quarters (72%, n=58) of the clients reported that they were less troubled or bothered by these problems at the follow up. Only 11% (n=9) of clients reported they were not at all bothered by mental health symptoms at intake and at the follow up. Only one client reported a hospitalization due to emotional or mental health reasons at the 12 month follow up.



Psychiatric problem days reduced from **16** to **7**, a **56%** decrease

Table 4. Psychiatric Outcomes

Random sample intake and 12-month follow-up differences

Item	Intake		12 Month Follow-Up		n	Significance
	No	Yes	No	Yes		
Serious Depression in Past 30 Days	53.9%	46.1%	76.3%	23.7%	76	.005*
Serious Anxiety in Past 30 Days	39.0%	61.0%	63.7%	36.3%	77	.001***
Trauma in Past 30 Days	82.1%	17.9%	88.8%	11.2%	78	.275
Grief or Loss in Past 30 Days	79.5%	20.5%	82.5%	17.5%	78	.683
Suicidal Thoughts in Past 30 Days	77.6%	22.4%	98.8%	1.2%	76	<.001***
Suicide Attempts in Past 30 Days	93.3%	6.7%	100.0%	0.0%	75	.025*

Note. * ≤ .05. *** ≤ .001

Family and Social

Family members have a critical role to play in clients' recovery. As part of AAC's program, family members are contacted as early on and invited to participate in family therapy with the client, in addition to the client's individual therapy which often addresses family dynamics.

Clients were asked about their relationships with family members as well as friends, co-workers, and other social connections. Clients reported improvement in both their relationships with family members and other social relationships from intake to follow up. Specifically, the average number of days of serious conflict with family members decreased from 7.8 days at intake to .5 days at the follow up, and the number of days of serious conflicts with others outside of the family decreased from 3.4 days to 1 day. Over half reported that they were less troubled or bothered by problems related to their family relationships (74%, n=60), and just under half reported this reduction for other social relationships (47%, n=38). A small proportion of clients reported that they were not at all bothered by family problems at either intake or follow up (20%, n=16), and a much larger proportion were not at all bothered by social relationships at either intake or follow up (44%, n=36).



Family conflict days reduced from **8** to **.5**, an **94%** decrease

Table 5. Family Outcomes

Random sample intake and 12-month follow-up differences

Items	<i>Intake</i>		<i>12 Month Follow-Up</i>		<i>t</i>	<i>p-value</i>	<i>n</i>	<i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
Serious Family Conflicts in Past 30 Days	7.86	10.37	1.24	4.30	5.07	<.001***	78	0.83

Notes. Items have been rephrased for reporting purposes; see ASI for original item wordings. *M* = mean, *SD* = standard deviation, *t* = paired t-test, *n* = sample size, *d* = Cohen’s *d* effect size. **p* ≤ .05. *** *p* ≤ .001. †Items range on scale of 1-5.

Summary

American Addiction Centers facilities are accredited by either the Joint Commission (TJC) or the Commission on Accreditation of Rehabilitation Facilities (CARF), and their techniques and intervention strategies are rooted in scientific research. The company believes that recovery is possible for anyone, that hope is key, and that providing individuals with tools to help them remain clean and sober for life is a primary aim of American Addiction Centers treatment.

This strong belief in the philosophy and approach to treatment lead AAC to hire a third-party independent evaluation team in 2015. Evaluators were asked to measure outcomes among clients entering AAC for residential treatment, at discharge from treatment, and at 2, 6 and 12 month post-discharge intervals. The evaluation was specifically designed to measure critical health and social functioning outcomes that are typically the major reasons for relapse to substance use following treatment (e.g., alcohol use, drug use, mental health symptomatology, lack of family/community recovery support, etc.)². Valid and reliable instruments were selected to measure each of these areas of functioning and were collected as a routine part of intake and discharge information gathering. The evaluation team established a call center solely dedicated to tracking and interviewing clients after discharge from treatment so that these same outcomes could be measured over time.

This White Paper represents a sub-study of a larger 3-year evaluation. The results demonstrate that randomly selected clients who completed AAC treatment experience positive outcomes in all of the key functional domains assessed and that these improvements are maintained twelve months post discharge. There were significant reductions in alcohol and drug use, and over half of the clients had not used any substances in the 30 days prior to the follow up interview. Among those who were using, the average number of days reduced, as well as the extent to which the client was impacted by alcohol or drug problems as compared to intake. Additionally, clients reported a reduction in mental health symptoms, including depression, anxiety, and trauma. There was a large reduction in suicidal thoughts and suicide attempts from intake to follow up as well. While relatively few clients reported physical medical issues at intake, there were very few hospitalizations, emergency room visits, and a low average number of physical health problem days at follow up.

² McLellan AT, Alterman AI, Metzger DS, et al. (1994). Similarity of outcome predictors across opiate, cocaine, and alcohol treatments: role of treatment services. *Journal of Consulting Clinical Psychology*, (62), 1141-1158.