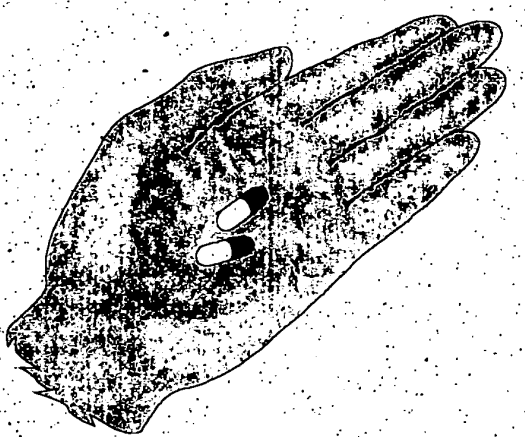
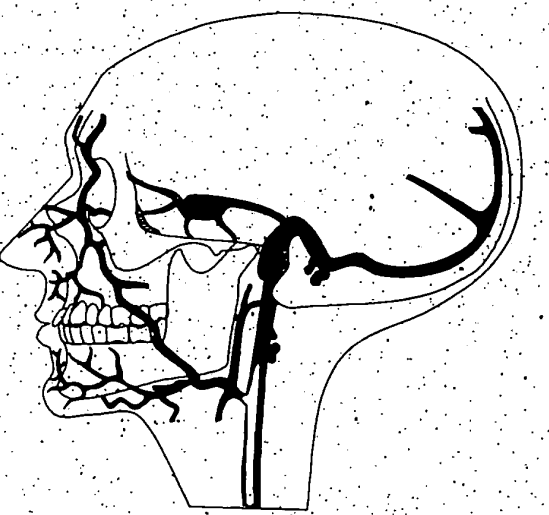
SODAT - DELAWARE, INC.
NALTREXONE ALTERNATIVE PROGRAM:
(SNAP)
A HEROIN ADDICT OUTPATIENT TREATMENT PROGRAM





AN OUTCOME EVALUATION

CONDUCTED BY THE
DELAWARE CRIMINAL JUSTICE COUNCIL
RESEARCH AND PROGRAM EVALUATION UNIT
820 N. FRENCH STREET 10TH FLOOR
WILMINGTON, DELAWARE 19801
302 - 577 - 5030

May 1999

98-DD-BX-0022

STATE OF DELAWARE
EXECUTIVE DEPARTMENT
CRIMINAL JUSTICE COUNCIL
STATE OFFICE BUILDING - TENTH FLOOR
820 FRENCH STREET
WILMINGTON, DELAWARE 19801

TELEPHONE (302) 577-5030
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July 30, 1999

Shannon O'Connor
Grant Manager
U.S. Department of Justice
Bureau of Justice Assistance
810 7th Street, N.W. Room 4433
Washington, D.C. 20531

98 - DD - BX - 0022

Dear Ms. O'Connor:

Please find enclosed a copy of SODAT - Delaware, Inc. Naltrexone Alternative Program: SNAP A Heroin Addict Outpatient Treatment Program - An Outcome Evaluation. The final evaluation under the Byrne grant, Elder Abuse and Exploitation project: An Evaluation is under final review and I hope to publish it by the end of August.

Please also find enclosed a copy of the latest shooting report. The report is conducted monthly to track shootings in Wilmington since the implementation of Operation Safe Streets.

I hope you find the SODAT evaluation both interesting and satisfactory. Please feel free to call me at 302 - 577 - 8728 if you have any questions.

Sincerely yours,

Arthur H. Garrison

Arthur H. Garrison
Criminal Justice Planning Coordinator

CC: James Kane

STATE OF DELAWARE
EXECUTIVE DEPARTMENT
CRIMINAL JUSTICE COUNCIL
STATE OFFICE BUILDING - TENTH FLOOR
820 FRENCH STREET
WILMINGTON, DELAWARE 19801

TELEPHONE (302) 577-5030
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TO: James Kane
Joe Paesani
Tom McGonigle
Stan Taylor

FROM: Arthur H. Garrison

DATE: July 12, 1999

RE: Shootings in Wilmington

Please find enclosed a comparison of shootings in the City of Wilmington between January and December in 1996, 1997 and 1998 as well as shootings from January through June 1999.

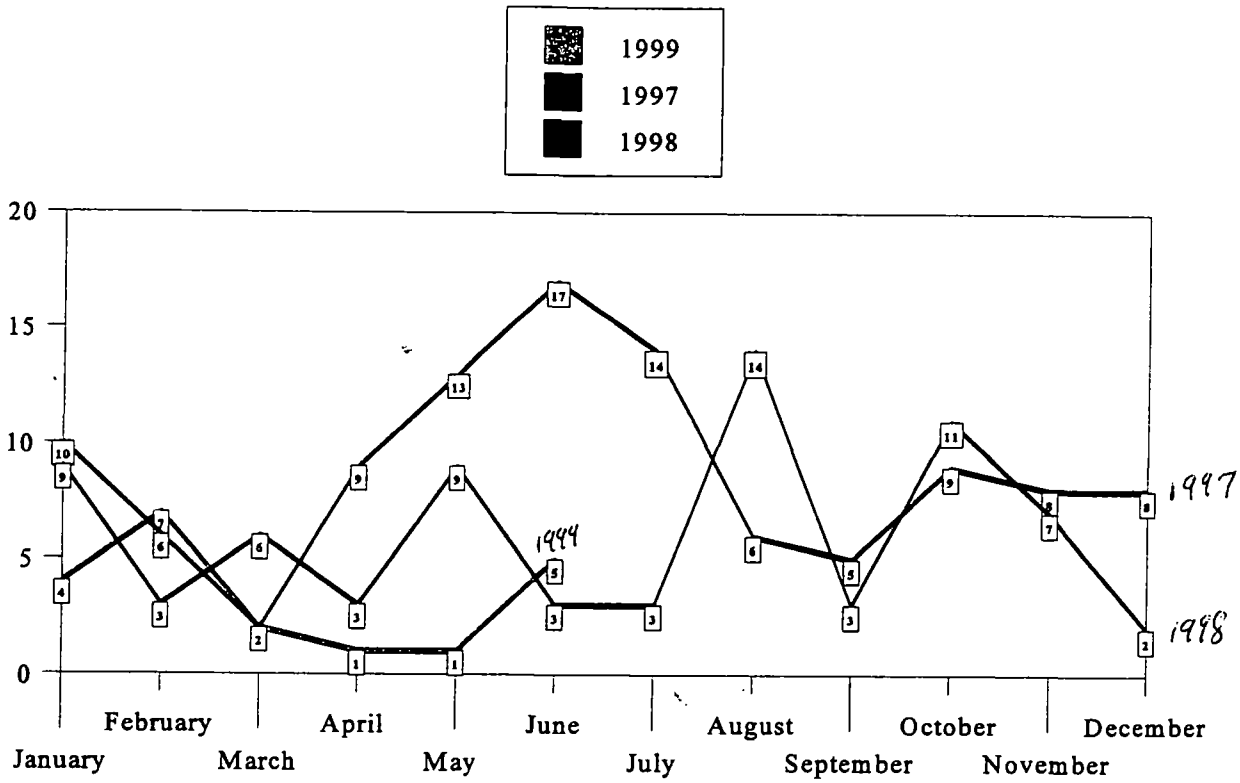
In 1996, there were 43 shootings from January through June.

In 1997, there were 57 shootings from January through June.

In 1998, there were 33 shootings from January through June.

In 1999, there were 20 shootings from January through June.

There was a 40% decrease in the number of shootings between January and June 1999 compared to the same period in 1998. There was a 53% decrease in the number of shootings between January and June 1999 compared to the same period in 1996 - pre operation safe streets.



Number of shootings in the City of Wilmington between January and Dec. 1996 - 1998 and January through June 1999*

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	**Total**
1996	6	7	5	13	7	5	21	6	12	4	11	10	**107**
1997	10	6	2	9	13	17	14	6	5	9	8	8	**107**
1998	9	3	6	3	9	3	3	14	3	11	7	2	**73**
1999	4	7	2	1	1	5							

* Chart shows number of shooting victims.

Source: WPD Crime Analysis Dept. 7/12/99

SODAT Naltrexone® Alternative Program (SNAP)
SODAT-DE, Inc.
625 North Orange Street
Wilmington, DE 19801

Project Numbers:	DB95-17, DB96-22, DB97-03
Contacts:	Valarie Tickle, Criminal Justice Council, Monitor Arthur H. Garrison, Criminal Justice Council, Program Evaluator Kenneth Collins, SNAP Program Director Dr. Danilo Yanich, University of Delaware,

Award History:	**1995**	**1996**	**1997**
Federal=	$55,000.00	$55,000.00	$55,000.00
State=	$0.00	$0.00	$0.00
Match=	$15,452.00	$15,452.00	$15,467.00

Project Period:	October 7, 1993 - July 22, 1998
Research Period:	October 7, 1993 - July 22, 1998

Written by

Arthur H. Garrison
Criminal Justice Planning Coordinator

Data Collection

Merle Eddy
Criminal Justice Intern
Delaware Criminal Justice Council

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Delaware Criminal Justice Council

Data Analysis

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Delaware Criminal Justice Council

with assistance from

Dr. Danilo Yanich
School of urban Affairs and Public Policy
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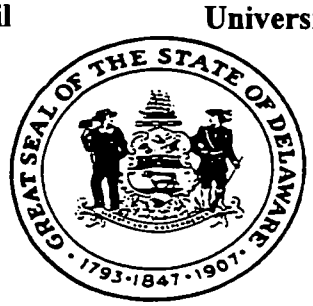

May 1999

Acknowledgments

The author would like to thank Lisa M. D'Angelo, CRNP of the University of Pennsylvania Treatment Research Center for her assistance and guidance in understanding the nature of heroin addiction and naltrexone treatment. As well as Janis Hunter, Medical Librarian, and the library staff at the Delaware Health and Human Services Delaware Psychiatric Center for their assistance in securing research used in this evaluation. Their help was invaluable.

This project was supported by grant No.98 - DD - BX - 0022 awarded by the Bureau of Justice Assistance, Office of Justice Programs, U.S. Department of Justice. The Bureau of Justice Assistance is a component of the Office of Justice Programs, which also includes the Bureau of Justice Statistics, the National Institute of Justice, the Office Juvenile Justice and Delinquency Prevention, and the Office of Victims of Crime. Points of view or opinions in this document are those of the author and do not necessarily represent the official position or policies of the United States Department of Justice.

Table of Contents

Executive Summary

The SNAP program was a combination of providing naltrexone, an opioid antagonists, and intense group therapy in an effort to end heroin addiction. The program operated from October 7, 1993 through June 22, 1998. A total of 73 clients received the naltrexone treatment in combination with therapy.

In 1995, the Delaware Criminal Justice Council provided funds to support the naltrexone drug treatment program for heroin addicts, implemented by SODAT - Delaware, Inc. This outcome evaluation assessed the success of the stated impact (outcome) objectives of the program. The four stated outcome objectives were as follows:

1. Have 60% of the heroin addicts who begin treatment stay off all drugs during treatment;

   Finding: ▸ Of the 73 participants in the program, 18 (25%) tested positive for drugs and 55 (75%) tested negative for drugs during treatment.

2. Have 60% of the heroin addicts who begin treatment successfully complete the program;

   Finding: ▸ Of the 73 participants in the program, 10 (13.7%) were successfully discharged from the program.

3. Increase the number of SNAP participants who are employed, in school, or in vocational training by 50% within 90 days of their admission into treatment; and,

   Finding: ▸ Data was only available for employment. At the beginning of the program 46.6% of the participants were employed and 52% were unemployed. Participants exited the program with a 57.5% employment rate and a 39.7% unemployment rate.

4. Have 60 percent of eight remain heroin free six months after completing the 18 month program.

   Finding: ▸ This objective was not assessed due to insufficient contact with program participants after leaving program.

The program met two of the three outcome objectives. Although 75% of the participates remained drug free during the program, 83.6% of the participants failed to complete the program successfully. These results lead to the observation that remaining drug free in a heroin antagonist treatment program may not be related to successful completion of the heroin addiction treatment. The majority of SNAP clients were African American, who were single and male. The median age of SNAP participants was 31 years old.

During the implementation of the evaluation some additional research questions were posed. These were as follows:

1. What was the performance of SNAP program participants who had previous drug treatment experience?

2. What was the relationship between program discharge status and length of participation in the program?

3. What was the relationship between successful completion in the SNAP program and marital status and employments status?

4. What was the relationship between the first age of substance abuse and those who first used heroin to success or failure in the SNAP program?

Previous drug treatment did not provide an increased chance of successful completion in the program. Of the seventy SNAP participants who had prior drug treatment histories, 84 percent failed to successfully complete treatment. Being married did not prove to be a positive factor in successful treatment. Participants who were married and successfully completed treatment accounted for only 6.6 percent of the total SNAP population compared to the 15.8 percent of those who were single and successfully completed treatment. Being employed was associated with program success. Those participants who were employed and successfully completed treatment accounted for 21 percent of the total SNAP population compared to the 3 percent who were unemployed and successfully completed treatment. Most of the SNAP participants started to use drugs in their early teen years. The longer length of time of use of drugs did not prove to be associated with successful treatment. The variable of longer length of time of use of drugs did prove to be associated with failure to successfully complete treatment. The rate of arrest post program discharge showed that the majority of those who had post arrests were participants who did not successfully complete the program.

The following recommendations for future heroin drug treatment program design are made after review of the literature on heroin addiction and treatment as well as from results of this evaluation:

1. Heroin drug treatment programs for non professional, high addiction level, street addicts have success rates ranging from a low of 12 percent to a high of 20 percent. Program impact objectives should not propose success rates that are beyond the current state of the art in treatment.

2. Assessment of success of naltrexone treatment programs should be made using multiple measures including abstinence rates, improvement in employment status, success in therapy treatment, reaching social goals, positive behavior changes and the level of involvement in criminal activity rather than on retention alone.

3. More than 80 percent of the clients in the SNAP program were classified as failure due to noncompliance with the program. Dug treatment programs like the SNAP program should assess the program's theory and implementation based on the type of clients that participate in the program.

4. The presence of psychological dysfunction in potential clients can effect retention and successful completion rates. Programs should determine whether the treatment modality will include clients who have psychological problems.

5. Drug addiction is not a problem in which the addiction to a specific drug is the only focus of attention. Drug addiction is usually one member of a family of issues within the life of the addict. Treatment programs need to be designed to address the individual addict and quality of life issues that the addict is experiencing along with the addiction to the drug itself.

6. Program designers should consider the biological as well as the cognitive-behavioral aspects of addiction when designing drug addiction modalities.

7. The biochemical and cognitive-behavioral aspects of drug addiction presents the criminal justice system with political as well as social policy issues. The criminal justice system needs to contend with the implications of the fact that drug addicts have altered brain chemistry, while maintaining its inherent purpose of focusing on individual accountability and responsibility. Conversely, drug treatment designers and drug addiction scientists must contend with the fact that personal responsibility and accountability will always be a demand of policy makers and the public regardless of the science of addiction.

Introduction

More than 74 million Americans have tried an illicit drug at least once in their lifetime, and 2.4 million Americans have tried heroin at least once in their lifetimes.[1] This usage of illicit drugs has increased over the past two years. In 1996, 23 million Americans had tried illicit drugs at least once and 460,000 had tried heroin at least once.[2] In 1979, there were about 128,000 Americans who used heroin and by 1996 that number had risen to 216,000.[3] "The majority of heroin users are still older, chronic users who inject the drug. At the same time, the number of new, young users who snort or smoke the drug, continues to rise."[4] According to the DEA, the "typical heroin user today consumes more heroin than a typical user did just a decade ago, which is not surprising given the higher purity currently available at the street level."[5] Historically heroin is taken intravenously, subcutaneously (under the skin), or intramuscularly[6] but due to the high level of purity (as high as 98 percent), it can be snorted or smoked. The purity of the heroin now makes heroin snorting possible, and makes heroin more "appealing to new users because it eliminates both the fear of acquiring syringe-borne diseases . . . and the historical stigma attached to intravenous heroin use."[7]

In Newark, Delaware, the purity of heroin has been found to range from 20 to 90 percent.[8] The New Castle County Police have reported that purity levels have been found to be as high as 97% in Dover, Delaware.[9] According to the Office of National Drug Control Policy, Newark, Delaware sources report that there has been a "'definite increase in teenage users'. . . dealers, some from nearby Philadelphia, are making a clear attempt to establish a new market. For example, by encouraging young females to begin use, dealers hope to attract older male users. In that area, users start at around 13, and the source reports that there are 'chronic' users aged 15 - 17."[10] It has recently been reported that between 1993 and 1995, 88 percent of new heroin users were between the age of 12 to 25 years old.[11] The "average age of addicts seeking treatment is getting younger. In 1993, only 17.2 percent of heroin addicts who reported for treatment were 24 or younger. By 1997, the percentage had climbed to 31.7 percent."[12] The number of people who are treated for heroin addiction in Delaware has increased from 336 in 1991 to 1,767 in 1997, an increase of 426 percent.[13] The impact of the increase in heroin usage can be seen in the

number of heroin related deaths. Deaths related to heroin have increased from 14 in 1991, to 29 in 1997.[14] The national average of heroin purity is 35 percent.[15] The purity average level for heroin in Delaware is 85 percent.[16]

In an effort to deal with the growing heroin use problem in Delaware, SODAT - Delaware[17], Inc., received a $55,000 grant in 1995 from the Delaware Criminal Justice Council.[18] Subsequent grants were made in 1996 and 1997.[19] The SODAT Naltrexone Alternative Program (SNAP) was designed to provide "intensive outpatient therapy which utilizes the blocking medication, naltrexone, to assist eight heroin addicted persons in their attempts to discontinue the use of heroin and other drugs, and to promote pro-social behavior with no new criminal arrest."[20]

The purpose of this outcome evaluation will be to assess whether the stated impact objectives of the SNAP program were achieved.

- **Program Narrative (Statement of the Problem)**

As noted in the introduction, heroin use is increasing nationwide and in Delaware due to the higher level of purity. The number of teens and young adults who have tried heroin and are becoming addicted to heroin is increasing. In an effort to address the addiction of heroin, SODAT has been funded to implement an outpatient heroin treatment program which uses the drug naltrexone to assist those who are trying to end their addiction.

- **Program Goal / Objective Identification**

As noted in the introduction, the goal of the SNAP program is to provide naltrexone to heroin addicts in order to assist in the discontinuation of heroin use. The specific program objectives are as follows:

1. have 60% of the heroin addicts who begin treatment stay off all drugs and in treatment throughout the year;

2. have 60% of the heroin addicts who begin treatment successfully complete the program;

3. increase the number of SNAP participants who are employed, in school, or in vocational training by 50% within 90 days of their admission into treatment; and,

4. have 60% of eight participants remain heroin free six months after completing the 18 month program.[21]

- **Program Theory**

The SNAP program is based on the theory that the heroin addict, (once detoxification is completed) will be assisted in ending his/her heroin addiction if medication is provided that blocks the effects of heroin use. The heroin blocking medication provided was

naltrexone. "Naltrexone is an orally administered medication which prevents the uptake [affects] of opioid compounds. Thus, when taking this medication, any person who uses heroin by any route will not experience any affects whatsoever. In conjunction with intensive outpatient therapy and therapeutic case management services, the naltrexone protocol has proven to be very effective in the treatment of heroin addiction."[22]

- **Program Design**

As noted, in the 1995 grant the "general focus of SNAP treatment is on client stabilization, maintenance of [a] drug free and crime free lifestyle, securing a recovery oriented support network, and providing relapse prevention education."[23] The SNAP program was designed to provide a four phase treatment strategy for heroin addicts over a 12 to 18 month period.

In phase one, "the treatment focus [is] on client stabilization."[24] The client must first be heroin free for seven days. If the client is found to have heroin in his/her system, the client is referred to detoxification. Once the client is found to be free from heroin use for seven days, administration of naltrexone is provided. "Phase [one] is an intensive portion of treatment and involves client attendance in six treatment groups weekly, bi-monthly individual and case management sessions, and referral to daily 12-step support group meetings. The client is discouraged from seeking employment for the duration of this phase."[25] Phase one continues between one and three months.

In phase two, focus on treatment shifts to relapse prevention. This phase "involves three therapeutic groups weekly, monthly individual counseling sessions and referral to 12 - step support group meetings. The duration of Phase-II is directly related to client progress and may continue for 5-7 months. Naltrexone may be discontinued after successful completion of a combined total of 6 months of treatment."[26]

In phase three, group therapy continues but is reduced to "two treatment groups weekly and monthly individual counseling. Clients continue at this stage in treatment for 3-6 months."[27] In phase four, aftercare services are provided. The use of group treatment is continued and

clients "are required to attend one group session a week, monthly individual counseling and weekly 12 step support group meetings."[28]

- **Heroin addiction and naltrexone treatment**
  - **Heroin Addiction: a brief history**

Heroin is a semisynthetic derivative of opium prepared from morphine.[29] Heroin was first introduced into medicine in 1898, and was used as a pain medication until the addictive nature of opioids in general were found.[30] Heroin is classified as a narcotic due to its ability to produce mood and behavior changes, potential for dependence and tolerance following continued use, and it being a derivative of opium.[31] In 1914 the Harrison Act was passed, which "was interpreted as excluding the provision of opioids to addicts as a legitimate medical use."[32] Although the use of opiates was illegal, "heroin addiction persisted and its prevalence rose following World War II [and by] the early 1960's [many recommended] remedicalizing heroin distribution as a way to reduce crime associated with heroin addiction."[33]

With the increase of heroin addiction in the U.S. Military during the Vietnam War and in society as a whole, federal funds were expended for both research and treatment of heroin addicts.[34] Over the past thirty years, various techniques have been developed to treat heroin addicts. One of the treatment methods developed over the past 25 years, involves the use of long-acting opioid antagonists for heroin addicts.[35] Antagonist treatment methods differ from substitution (maintenance) treatment programs in that the antagonist programs use medication to eliminate an addiction. Substitution treatment methods uses one drug, methadone for example, as a replacement for another drug, heroin. The SNAP program is an antagonist treatment program that uses the opioid antagonist naltrexone, which "blocks or reverses the psysiologic and psychological effects of opioids by binding opiate receptors" in the brain.[36]

- **Antagonist Treatment: Naltrexone**

Naltrexone "prevents or reverses opioid effects [and] will precipitate abstinence . . . in narcotic addiction."[37] The use of naltrexone is based on "the assumption that classically conditioned withdrawal symptoms and operantly reinforced drug seeking behaviors contribute to high relapse"[38] in heroin addicts.

> Theoretically, by blocking the euphoric effects of opioids, treatment with antagonists would lead to the extinction of operantly reinforced drug seeking; by preventing the reestablishment of physical dependence, treatment with antagonists also leads to the eventual extinction of conditioned withdrawal phenomena. Recently, . . . empirical and laboratory observations [show] patients taking naltrexone experience less craving in the presence of opioid-related cues, presumably because, on a cognitive basis, they are aware that they are unable to experience the opioid effects.[39]

Early studies and theoretical use of naltrexone proposed that naltrexone would be effective in dealing with impulsive and compulsive heroin use in addicts who are in treatment.[40] Early research on heroin addiction recognized that recovering heroin addicts could recidivate, and develop full addiction due to impulsive heroin use by environmental stimuli. The stimuli could be an interaction between the recovering addict and a friend, whom the addict had a history of heroin use with, or being in a neighborhood in which heroin is used. The stimuli causes a craving for the heroin that could cause re-addiction. Goldstein explained that, "naltrexone can protect against impulsive use and can prevent the consequences of impulsive use. The protective medication [the naltrexone] is taken at a time when motivation [to end the addiction] is high, then later, if circumstances arise that would typically lead to use the agonist drug [heroin], there is a strong reason to avoid that behavior" because the subject knows the heroin will not have any effect.[41] Naltrexone can also aid in the reduction of compulsive addiction. The cognitive knowledge that the use of the heroin will not have an effect reduces the obsessing over the craving for the heroin. Thus naltrexone will assist the addict in developing behavior reinforcers of resisting the thoughts and desires for the drug, in turn reducing compulsive addictive behavior.

Although use of naltrexone has been found to block the effects of heroin, one of the biggest problems in heroin addiction[42] treatment, along with heroin detoxification of addicts, is

low compliance in taking the naltrexone by the addicts and their high drop out rate.[43] Kaplan and Sadock noted that in one study, "the dropout rate was quite high: 25 percent of subjects who started treatment dropped out within two weeks; 94 percent stopped by nine months."[44] In a study in Israel, the average retention rate for program participants was 56.3 days.[45] Out of a total of 32 patients, 58 percent completed the program.[46] Forty percent of the patients dropped out of the program within 2 weeks and 60 percent of the patients who dropped out did so within the remaining ten weeks of the program.[47]

Methodology

Between October 7, 1993 and July 22, 1998, the SNAP program provided 73 participants naltrexone as part of their treatment for heroin addiction. Data was collected from the case files of all 73 participants which included basic demographic information (age, gender, race), employment status, history of drug abuse, and drug use after the first ingestion of naltrexone. The results of the data collection are noted below.

Outcome Objectives

The stated outcome objectives of the SNAP program were as follows:

1. have 60% of the heroin addicts who begin treatment stay off all drugs during treatment;

   Finding: ▸ Of the 73 participants in the program, 18 (25%) tested positive for drugs and 55 (75%) tested negative for drugs.

2. Have 60% of the heroin addicts who begin treatment successfully complete the program;

   Finding: ▸ Of the 73 participants in the program, 10 (13.7%) were successfully discharged from the program.

3. Increase the number of SNAP participants who are employed, in school, or in vocational training by 50% within 90 days of their admission into treatment;

   Finding: ▸ Data was only available for employment. At the beginning of the program 46.6% of the participants were employed and 52% were unemployed. Participants exited the program with a 57.5% employment rate and a 39.7% unemployment rate.

4. Have 60 percent of eight remain heroin free six months after completing the 18 month program.

   Finding: ▸ This objective was not assessed due to insufficient contact with program participants after leaving program.

During the evaluation of the SNAP program some additional research questions were posed:

1. What was the performance of SNAP program participants who had previous drug treatment experience?

2. What was the relationship between program discharge status and length of participation in the program?

3. What was the relationship between successful completion in the SNAP program and marital status and employments status?

4. What was the relationship between the first age of substance abuse and those who first used heroin to success or failure in the SNAP program?

Descriptive data

Table I: SNAP Participants by gender and race			
	Gender		Total
	Male	Female	
African American	35	3	38
Caucasian	24	5	29
Hispanic	5	0	5
Other	1	0	1
Total	65	8	73

As shown in TablesI and II the majority of participants in the SNAP program were African Americans. African Americans accounted for 52.1 percent of all participants, and Caucasians accounted for 39.7 percent. Hispanics accounted for 6.8 percent.

Table II: SNAP Participants by marital status and race			
	Marital Status		Total
	Single	Married	
African American	31	7	38
Caucasian	23	6	29
Hispanic	3	2	5
Other	1	0	1
Total	58	15	73

As shown in Table III, the majority of SNAP patients were single (79.5%).

Table III: SNAP Participants by marital status and gender			
	Marital Status		Total
	Single	Married	
Male	50	15	65
Female	8	0	8
Total	58	15	73

SNAP participants were asked what was the first drug that they used during their history of drug use. The responses, as shown in Table IV, showed that the most frequent introduction drug was alcohol (38.4%), followed by marijuana (32.9%). Heroin was the third most frequent introduction drug (13.7%), followed by cocaine (9.6%).

Table IV: First Drug Used by SNAP participants		
	Number	Percentage
Alcohol	28	38.4
Barbiturates	2	2.7
Cocaine	7	9.6
Heroin	10	13.7
Marijuana	24	32.9
Methadone	1	1.4
Missing data	1	1.4
Total	73	100.0

The median age for first drug use was 15 years old and the average first age for drug use was 16.7 years old. The most frequent (mode) first age of drug use was 14 years old.

As shown in Table V, the majority of SNAP participants began their drug use between 13 and 18 years old. The second most frequent start date for drugs was between 4 and 12 years old. Those beginning drug use in young adulthood only accounted for 19 percent of the total.

Table V: First age of drug use by age group

Age Group	Number	Percent
4 to 12	16	22.0
13 to 18	43	59.0
19 and older	14	19.0
Total	73	100.0

Findings

Outcome Objective 1:

Have 60% of the heroin addicts who begin treatment stay off all drugs during treatment

Finding: ▸ **Of the 73 participants in the program, 18 (25%) tested positive for drugs and 55 (75%) tested negative for drugs.**

Table VI: Results of 1st drug screen of SNAP participants		
	Number	**Percentage**
Cocaine found	7	9.6
Heroin found	6	8.2
Marijuana found	4	5.5
Phincyclidine found	1	1.4
Negative drugs found	**55**	**75.3**
Total	73	100.0

To assess the achievement of this first objective, the first four consecutive drug tests after naltrexone was taken were reviewed. As shown in Table VII, the rate of negative drug use results in the second through the fourth drug test show an improvement from 58 cases of negative drugs to 63 cases.

Table VII: Second through fourth drug screening of SNAP participants		
	Number	**Percentage**
Second Drug Test - Negative	58	79.5
Third Drug Test - Negative	58	79.5
Fourth Drug Test - Negative	63	86.3

In order to assess client positives for heroin after the first four consecutive drug tests, each client file was reviewed for positives for heroin after the date of the fourth drug test.

As shown in Table VIII, 69.9 percent of SNAP participants tested negative for heroin use between their fourth drug test and discharge from the SNAP program.

Table VIII: First positive drug screen for heroin after initial four drug screens of SNAP participants		
	Number	**Percentage**
Negative	51	69.9
Positive	13	17.8
Discharge Before Fourth Drug Test	9	12.3
Total	73	100.0

Table IX: Second positive drug screen for heroin after initial four drug screens of SNAP participants		
	Number	**Percentage**
Negative	59	80.8
Positive	5	6.8
Discharge Before Fourth Drug Test	9	12.3
Total	73	100.0

As shown in Table IX, the percentage of negative heroin drug use increased to 80.8 percent between the second positive heroin result and final discharge from the SNAP program.

Outcome Objective 2:

Have 60% of the heroin addicts who begin treatment successfully complete the program

Finding: ▸ **Of the 73 participants in the program, 10 (13.7%) were successfully discharged from the program.**

Table X: SNAP Participant discharge		
	Number	Percentage
Completed Treatment	**10**	**13.7**
Deceased	1	1.4
Failure - Noncompliance	61	83.6
Withdrew from the program positively	1	1.4
Total	73	100.0

As discussed below, the SNAP program did not meet its objective of 60% of participants would successfully complete treatment. However, 60 percent success rate was not a realistic objective for an antagonist heroin treatment program. The literature shows that success rates for these types of programs range between 10 and 20 percent.

Outcome Objective 3:

Increase the number of SNAP participants who are employed, in school, or in vocational training by 50% within 90 days of their admission into treatment

Finding: ▸ **Data was only available for employment. At the beginning of the program 46.6% of the participants were employed and 52% were unemployed. Participants exited the program with a 57.5% employment rate and a 39.7% unemployment rate.**

Table XI: Employment status of SNAP participants

	Before		After	
	Number	Percentage	Number	Percentage
Employed	34	46.6	42	57.5
Unemployed	38	52.1	29	39.7
Missing Data	1	1.4	2	2.7
Total	73	100.0	73	100.0

The data on employment status of participants was not collected to determine the timing in which participants secured employment during participation in the SNAP program. Although the objective is written to assess the increase in employment within 90 days of entering treatment, the actual goal intended was that participants who did not have employment upon entering the program would be employed by the time of discharge. The case files maintained by the SNAP program uniformly noted employment status of each participant upon entering and discharge from the program.

Looking at the employment status of the participants upon entry and discharge from the program, there was a 19 percent increase in the number employed, from 34 to 42. Similarly, there was a 23.7 percent decrease in the number unemployed, from 38 to 29.

Additional Research Questions

Question One:

What was the performance of SNAP program participants who had previous drug treatment experience?

Seventy participants had multiple histories of drug treatment of which, 84.5 percent (60) failed to complete treatment and 12.7 percent (9) successfully completed treatment. The remaining 2.8 percent of those with multiple drug treatment histories included one client who died and one who withdrew positively from the program but did not complete the treatment program. As shown in Table XII, those participants who had prior drug treatment histories between 0 and 3 accounted for 57.5 percent of all cases.

Table XII: Number of prior treatment histories

Number of prior attempts	Number of participants	Percentage	Cumulative Percentage of total cases
0	1	1.4	1.4
1	9	12.3	13.7
2	7	9.6	23.3
3	25	34.2	57.5
4	14	19.2	76.7
5	4	5.5	82.2
6	3	4.1	86.3
7	2	2.7	89.0
9	1	1.4	90.4
11	1	1.4	91.8
14	1	1.4	93.2
15	1	1.4	94.5
39	1	1.4	95.9
Unknown	3	4.1	100.0
Total	73	100.0	

The median prior drug treatment attempts was 3, accounting 34.2 percent of all cases. Those participants who had prior histories between 0 and 4 accounted for 76.7 percent of all cases.

Question Two:

What was the relationship between program discharge status and length of participation in the program?

As shown in Table XIII, of those who successfully completed treatment 90 percent participated in the program longer than 6 months. Conversely, 60.7 percent of those who failed to complete treatment remained in the program less than six months.

Table XIII: Discharge status and length of SNAP participants participation

Discharge Status		SNAP participant presence in program		Total
		Greater than six mos.	Less than six mos.	
Completed treatment	Number	9	1	10
	% within discharge status	90.0	10	100.0
Failure - non compliance	Number	24	37	61
	% within discharge status	39.3	60.7	100.0
Deceased	Number	0	1	1
	% within discharge status	0.0	100.0	100.0
Withdrew from program positively	Number	1	0	1
	% within discharge status	100.0	0.0	100.0
Total	Number	34	39	73

Most of the participants remained in the program less than six months. Over all, 39 (53.4%) SNAP patients remained in the program less than six months. Thirty-four participants (46.6%) remained in the program longer than six months. The median length of time SNAP patients remained in the program was 4.9 months.

Question Three:

What was the relationship between successful completion in the SNAP program and marital status and employments status?

As shown in Table XIV, the majority of those who successfully completed treatment and those who did not were single. The data suggests that there may have been an inverse relationship between successful completion and being married.

Table XIV: Discharge status and marital status of SNAP participants

Discharge Status		Marital status at discharge from program			Total
		single	married	unknown	
Completed treatment	Number	9	1	0	10
	% within discharge status	90.0	10.0	0.0	100.0
Failure - non compliance	Number	46	14	1	61
	% within discharge status	75.4	23.0	1.6	100.0
Deceased	Number	1	0	0	1
	% within discharge status	100.0	0.0	0.0	100.0
Withdrew from program positively	Number	1	0	0	1
	% within discharge status	100.0	0.0	0.0	100.0
Total	Number	57	15	1	73

Those participants who were married and successfully completed treatment accounted for 6.7 percent of the total SNAP population (73) compared to 15.8 percent of those who were single and successfully completed treatment. Thus a higher percentage of those who were single successfully completed treatment than those who were married.

Those who were married and failed to complete treatment accounted for 93.3 percent of

the total SNAP population as compared to 80.7 percent of those who were single and failed to complete treatment. Thus a higher percentage of those who failed treatment were married than those who failed and were single. Single SNAP patients outnumbered married patients. Of the total SNAP patients, 57 (78.1%) were single and 15 (20.5%) were married.

As shown in Table XV, that the majority of those who successfully completed treatment and those who did not were employed at the time discharge. The data suggests that there may be a direct relationship between being employed and successful completion of treatment.

Table XV: Discharge status and employment status of SNAP participants

Discharge Status		Employment status at discharge from program			Total
		yes	no	unknown	
Completed treatment	Number	9	1	0	10
	% within discharge status	90.0	10.0	0	100.0
Failure - non compliance	Number	32	27	2	61
	% within discharge status	52.5	44.3	3.3	100.0
Deceased	Number	0	1	0	1
	% within discharge status	0.00	100.0	0.0	100.0
Withdrew from program positively	Number	1	0	0	1
	% within discharge status	100.0	0.0	0.0	100.0
Total	Number	42	39	2	73

Those participants who were employed and successfully completed treatment accounted for 21.4 percent of the total SNAP population (73) compared to 3.4 percent of those who were unemployed and successfully completed treatment. Thus a higher percentage of those who were employed successfully completed treatment than those who were unemployed.

Those who were employed and failed to complete treatment accounted for 76.2 percent of

the total SNAP population as compared to 93.1 percent of those who were unemployed and failed to complete treatment. Thus a higher percentage of those who failed treatment were unemployed than those who failed and were employed. Employed SNAP patients outnumbered those who unemployed. Of the total SNAP patients, 42 (57.5%) were employed and 29 (39.7%) were unemployed.

Question Four:
What was the relationship between the first age of substance abuse and those who first used heroin to success or failure in the SNAP program?

Table XVI compares the status of discharge to the first drug used by SNAP participants.

Table XVI: First drug used and discharge status relationship

First Drug used		Status of discharge				Total
		Completed	Failure	Deceased	Withdrew	
Alcohol	Number	6	20	1	1	28
	% of total participants	8.2	27.4	1.4	1.4	38.4
Barbiturates	Number	0	2	0	0	2
	% of total participants	0.0	2.7	0.0	0.0	2.7
Cocaine	Number	1	6	0	0	7
	% of total participants	1.4	8.2	0.0	0.0	9.6
Heroin	Number	1	9	0	0	10
	% of total participants	1.4	12.3	0.0	0.0	13.7
Marijuana	Number	2	22	0	0	24
	% of total participants	2.7	30.1	0.0	0.0	32.9
Methadone	Number	0	1	0	0	1
	% of total participants	0.0	1.4	0.0	0.0	1.4
Unknown	Number	0	1	0	0	1
	% of total participants	0.0	1.4	0.0	0.0	1.4
Total	Number	10	61	1	1	73
	% of total participants	13.7	83.6	1.4	1.4	100.0

Of the ten cases in which heroin was the first drug used, one SNAP client successfully completed treatment. This SNAP client was 20 years old when the first drug was used.

Table XVII, shows the age of first drug use compared to the drug first used. Note that marijuana was the drug most frequently used by youth 13 and 14 years old, and alcohol was the drug most used by youth 16 years old.

Table XVII: First Age Drug Used by SNAP Participants*

	Alcohol	Barbiturates	Cocaine	Heroin	Marijuana	Methadone	Percentage
4					1		1.4
8	2						2.7
9					2		2.7
10	3			1			5.5
11	2				1		4.1
12	2				2		5.5
13	3	1			4		11.0
14	3			1	6	1	15.1
15	2		1		1		5.5
16	4						5.5
17	2		2	3	2		12.3
18	2		2	1	2		9.6
19			1	1	1		4.1
20	1			2			4.1
21	1				1		2.7
22					1		1.4
24	1						1.4
26			1				1.4
32				1			1.4
38		1					1.4
Unknown							1.4
Total	28	2	7	10	24	1	100.0

* One case file did not have information on first drug used and age of first drug use.

In almost each age category, the majority of participants failed to complete treatment. There were four exceptions to these results; participants 15 and 16 years of age who used alcohol as the first drug used, participants 20 years of age who used heroin, and participants 12 years old who used marijuana. In the 15 year old group there were 2 participants of which 1 successfully completed treatment and the other did not. In the 16 year old group there were 4 participants of which 2 successfully completed treatment and 2 did not. Two participants who were 20 year old used heroin as the first drug of which 1 successfully completed treatment and the other did not. Two participants used marijuana as the first drug at the age of 12 of which 1 successfully completed treatment and the other did not.

As previously noted, the majority of the SNAP participants began to use drugs during their teen years. Table XVIII shows the range of first age drug use.

Table XVIII: First Age Drug Used by SNAP Participants

	Number	Percentage
4	1	1.4
8	2	2.7
9	2	2.7
10	4	5.5
11	3	4.1
12	4	5.5
13	8	11.0
14	11	15.1
15	4	5.5
16	4	5.5
17	9	12.3
18	7	9.6
19	3	4.1
20	3	4.1
21	2	2.7
22	1	1.4
24	1	1.4
26	1	1.4
32	1	1.4
38	1	1.4
Unknown	1	1.4
Total	73	100.0

Summary of Findings

The majority of SNAP participants were African American, who were single and male. Most of the participants were male. The median age of SNAP participants was 31 years old. Almost all of the participants had prior drug histories. The majority, 81 percent, began drug use before the age of 18 years old. The main two introduction drugs were alcohol and marijuana. More than 70 percent of SNAP participants used at least one of these drugs as the first drug in their drug use histories. The median age for first drug 15 years old and the 14 years old was the mode.

The majority of SNAP patients did not test positive for drugs while in the program. More than 75 percent of the participants remained drug free. But there was not a corresponding result in successful treatment by SNAP participants. The majority of SNAP participants did not successfully complete the program. While the majority of participants did not use drugs, only 13 percent successfully completed the treatment. These results may suggest that drug treatment success may not be related to remaining drug free during treatment. The majority of participants who entered the SNAP program did so unemployed (52%). At time of discharge, the majority of participants were employed (57.5%).

Previous drug treatment histories did not provide an increased chance of successful completion in the SNAP program. Of the seventy SNAP participants who had prior drug treatment histories, 84 percent failed to successfully complete treatment. As would be expected, the longer participants remained in the program the higher the rate of program success. Out of the 10 participants who succeeded in treatment, 9 remained in the program longer than 6 months. Conversely, 60 percent of those who failed to complete treatment remained in the program less than 6 months. The median length of time SNAP participants remained in the program was almost 5 months.

Being married did not prove to be a positive factor in successful treatment. Participants who were married and successfully completed treatment accounted for only 6.6 percent of the total SNAP population compared to the 15.8 percent of those who were single and successfully completed treatment. In other words, more SNAP participants were singe and successful than

their married counterparts. More interesting is that more SNAP participants who failed treatment and were single (80.7%) than those who were married (93.3%). The data may suggest that there may be an inverse relationship between successful completion and being married. An alternative theory could be that these married addicts had unstable marriages or were married to addicts. If so, these negative relationships could be decreasing the opportunity for the SNAP participants to take advantage of the program and successfully complete treatment.

Being employed was associated with program success. Those participants who were employed and successfully completed treatment accounted for 21 percent of the total SNAP population compared to the 3 percent who were unemployed and successfully completed treatment. Those who were employed and failed to successfully complete treatment accounted for 76 percent of the total SNAP population as compared to 93 percent of those who were unemployed and failed to successfully complete treatment.

As previously noted, most of the SNAP patients started to use drugs in their early teen years. The longer length of time of use of drugs did not prove to be associated with successful treatment, but with failure to successfully complete treatment. Across the first use age group, the majority of SNAP participants did not successfully complete treatment.

Criminal activity committed by SNAP participants after discharge from the program was low. As shown in Table XIX, almost half of all SNAP participants had no arrests charges after discharge.

Table XIX: Most serious arrests against SNAP participants after discharge

Arrest category	Number SNAP participants	Percentage
No arrests	32	43.8
Violent offenses	4	5.5
Property offenses	10	13.7
Non-violent offenses	14	19.2
Drug offenses	13	17.8
Total	73	100.0

Of the 13 drug related arrests; possession of a narcotic accounted for 6 arrests, possession of drug paraphernalia accounted for 3 arrests, possession with the intent to deliver accounted for 2 arrests, trafficking in cocaine accounted for 1 arrest and delivery of a narcotic accounted for 1 arrest. Violent offenses arrests included 2 arrests for terroristic threatening, 1 arrest for vehicular assault 2nd and 1 arrest for assault 3rd.

Table XX: Arrests of SNAP participants after discharge

Arrest category	Number SNAP participants	Percentage
No arrests	32	43.8
1 - 4 arrests	24	32.9
5 or more arrests	17	23.3
Total	73	100.0

As shown in Table XX, 24 participants accounted for 32.9 percent of all participants arrested between 1 and 4 times. More than 70 percent of the arrests made against SNAP participants after discharge were for 4 offenses or less. The combination of those not arrested and those who accounted for 1 to 4 arrests accounted for 76.7 percent of all SNAP participants.

As would be expected the majority of all arrests occurred with those who did not complete the program being that the majority of participants are in this category. Table XXI shows the types of arrests correlated to the discharge status of SNAP participants.

Table XXI: Most serious arrest of SNAP participants and discharge status from SNAP program

Most serious arrest		Status of discharge				Total
		Completed	Failure	Deceased	Withdrew	
No arrests	Number	7	24	1	0	32
	% of status of discharge	70.0	39.3	100.0	0.0	43.8
Violent offenses	Number	0	3	0	1	4
	% of status of discharge	0.0	4.9	0.0	100.0	5.5
Property offenses	Number	1	9	0	0	10
	% of status of discharge	10.0	14.8	0.0	0.0	13.7
Non - violent	Number	1	13	0	0	14
	% of status of discharge	10.0	21.3	0.0	0.0	19.2
Drug offenses	Number	1	12	0	0	13
	% of status of discharge	10.0	19.7	0.0	0.0	17.8
Total	Number	10	61	1	1	73
	% of status of discharge	100.0	100.0	100.0	100.0	100.0

The median time between discharge and first arrest for SNAP participants was 179 days and the average number of days was 278 days.

Discussion and Conclusion

In conclusion, this evaluation found similar results to the evaluation conducted in 1995 by Reed.[48] Dr. Reed found the SNAP program to be successful (75 percent drug free rate). As noted, a similar rate of 75.3 drug free rate was found in this evaluation. While Dr. Reed assessed the success of the program solely on drug tests, this evaluation reviewed the rate of successful treatment discharge. Assessing both outcomes, it is concluded that the SNAP program was partially successful.

The SNAP program achieved a 75 percent negative test for drug use and 13.7 percent treatment success rate. Based on the outcome objectives of the grant, the program failed to have 60 percent of SNAP participants successfully complete the program. But compared to the literature on naltrexone and heroin treatment, a 60 percent treatment success rate goal was not realistic. A review of the literature shows that success rate in naltrexone treatment programs for heroin addicts can range from 12 percent to 20 percent.[49] For example, O'Brien and Greenstein[50] note in their study only 12 percent of those who began treatment remained in the program beyond six months. In a study conducted by Tennant and his colleagues, only 16 percent of the program participants completed the program successfully. DiIppoliti and his colleagues conducted a study on treatment retention in Italy and found that after one year, the retention rate among 1503 heroin users using naltrexone was 18 percent.[51]

On the other hand, some of the results of the SNAP program showed better results than some of the work in the literature. Both noted in the in the literature and by the first evaluation by Dr. Reed, that patients in a naltrexone program will "test naltrexone's opiate blockade at least once during treatment."[52] The results of this program show that the patient on naltrexone may not test the blocking effect of the drug. The large majority of patients, 75 percent, did not test positive for any drugs during their participation in the program.

Other measures of drug treatment program success noted in the literature, including employment status change and post program arrest history, were achieved by the program. The SNAP program was able to have the majority of its participants leave the program employed, regardless of discharge status. Those who were employed at time of discharge had a higher rate

of successful treatment than those who were not employed. Additionally, the percentage of those who were employed and who failed the treatment program was less than those who were unemployed and failed the treatment program. Almost half of all participants, regardless of discharge status, were not arrested after leaving the SNAP program. Of those who were arrested only 5.5 percent (4) were arrested for violent offenses and only 17.8 percent (13) were arrested from drug related offenses. The majority of those who were arrested for drug offenses (12) were those who failed to complete treatment.

Other observations about drug addiction in the literature were confirmed, specifically that "softer" drugs are introductory drugs to "harder" drug use and drug use starts in the early years of adolescence. Alcohol and marijuana proved to be the two introduction drugs to the SNAP patients. Heroin proved to be a distant third. Drug use with the SNAP participants began in their teen years. A majority of the SNAP patients were between 13 and 18 when they first began using drugs. These results support the general belief that drug use begins in the early years of the addicts life and if a person can remain drug free through these early years the chances of becoming an addict decrease.

- **Heroin drug treatment programs for non professional, high addiction level, street addicts have success rates ranging from a low of 12 percent to a high of 20 percent. Program impact objectives should not propose success rates that are beyond the current state of the art in treatment.**

According to the literature, there are different types of heroin addicts with different expectancy rates of successful treatment completion.[53] The literature notes that naltrexone treatment programs are more successful with addicts who have a stable family structure; married to a non addicted mate; are highly motivated to stop using heroin; have good jobs; have minimal antisocial behavior; have low drug craving / addiction; or have high professional, social or economic status.[54] Programs with addicts who use heroin as a "self medication" have a higher rate of program discontinuation or failure.[55]

- **Assessment of success of naltrexone treatment programs should be made using multiple measures including abstinence rates, improvement in employment status, success in therapy treatment, reaching social goals, positive behavior changes and the level of involvement in criminal activity rather than on retention rates alone.**

The literature on treatment programs notes that high dropout rates is "the rule for all drug treatment modalities as for treatment of other psychological problems."[56] While the "retention rate" criteria has been the most used and widespread criterion for success, this criteria alone is unreliable for assessing the success of a treatment program or the individual client in treatment because it does not take into account changes in behavior and life style of the individual.[57]

One of the limitations to the retention rate criteria is that it does not take into account the factor of self - selection.[58] Use of retention rates as a determination of success is vulnerable to selection bias because those who successfully stay in a treatment program do so because the program does not expel them or they choose to remain in the program. Thus the "success" or "failure" of the program based on retention is artificially inflated or deflated by those who are removed from the program either by the participants' choice or by the program. Selection bias produces an outcome, i.e. success or failure, that can be explained as function of individual differences among the patients and not the treatment program itself.

Although, the "single most important predictor of success [is] the length of stay in treatment"[59] "the so-called retention rate . . . simply measures the length of time an addict stays in a program"[60] not the change in the addict due to the program. It has also been noted that retention rates can be associated with factors outside of the program including environmental support for drug addiction, personality characteristics of the addict, employment status, status and health of the addicts' family, psychological status of the addict, criminal history,[61] the readiness of the addict to change[62] and multiple drug use history.

- **More than 80 percent of the clients in the SNAP program were classified as failure due to noncompliance with the program. Drug treatment programs like the SNAP program should assess the program's theory and implementation based on the type of clients that participate in the program.**

Most of the clients were dismissed from the SNAP program due to noncompliance with the treatment modality. Research on program treatment dropouts as well as theory on behavior change notes that treatment programs work with patients who are future oriented,[63] with a positive motivation to change[64] and are at a stage in their addiction were preparation for change[65] is achieved. Future oriented meaning that the addict has made the decision to make change and end his or her addiction. Positively motivated in that the desire to change is self desired, in that *the addict wants* a better life. The addict is prepared to change and demonstrates this preparation by the formation of a plan to end the addiction. Such a plan can be made by deciding to enter a treatment program *with the desire and expectation to successfully complete it.*

The SNAP program is an action-oriented program designed to assist the addict who wants to change. If the program is servicing addicts who have not reached the point of having a future oriented, positive motivated, present tense mental state change and end their heroin addiction, success rates will be low regardless of the value of the program.

- **The presence of psychological dysfunction on potential clients can effect retention and successful completion rates. Programs should determine whether the treatment modality will include clients who have psychological problems.**

Recent research has asserted that many of those who enter drug treatment programs have moderate to severe mental illness.[66] More significant is the fact that only about half of those addicts who have a mental illness receive treatment for the mental illness and the drug addiction together.[67] The effects of mental illness and drop out rates have been shown to be associated.[68] Research has also found that mental illness can effect the ability to function and the impact of the drugs on the individual.[69] Programs that decide to address both drug addiction and mental illness should design treatment to take into account the importance of the clients quality of life. Recent research has noted that the patients quality of life (family support, employment, positive self image, ect.) can predict successful treatment independent of other factors including the psychiatric status of the client.[70]

- **Drug addiction is not a problem in which the addiction to a specific drug is the only focus of attention. Drug addiction is usually one member of a family of issues within the life of the addict. Treatment programs need to be designed to address the individual addict and quality of life issues that the addict is experiencing along with the addiction to the drug itself.**

The nature of addiction has been described as a state in which the addict has a (1) persistent regular use of a drug; (2) attempts to stop such use [leads] to significant and painful withdrawal symptoms; (3) continues to use the addictive drug despite damaging physical or psychological problems, or both; (4) engages in compulsive drug-seeking behavior; and (5) needs a constant increasing level of dosage of the drug to get "high".[71]

Treatment programs should conduct program design in the light of recent research that has observed that (1) drug use occurs within a broader family of social and psychological problems, (2) cognitive-behavioral abilities are fundamentally psychological in nature, (3) the motivation to change is a cognitive-behavioral process, and (4) the skills and the relationship between the client and the individual counselor has an impact on final outcome.[72]

- **Program designers should consider the biochemical as well as the cognitive-behavioral aspects of addiction when designing drug addiction treatment modalities.**

Virtually "all drugs . . . have common effects, either directly or indirectly, on a single pathway deep within the brain."[73] In regard to the effect of heroin on the brain, research has found that heroin focuses on the opioid receptors of the brain. As previously noted[74] the pleasure from opiates "can be more powerfully rewarding than that produced by natural reinforcers."[75] This assessment is significant in the study of how and why drug addiction is developed and maintained through positive and negative reinforcement.

In studies dealing with positive and negative reinforcement, it is believed that if pleasure responses can be secured artificially a person will choose the artificial stimulation even over natural positive stimulation such as food or sex. The "process in which a pleasure-inducing action becomes repetitive is called positive reinforcement. Conversely, abrupt discontinuation of alcohol, opiates, and other psychoactive drugs following chronic use . . . results in discomfort and craving. The motivation to use a substance in order to avoid discomfort is called negative reinforcement. Positive reinforcement is believed to be controlled by various neurotransmitter systems, whereas negative reinforcement is believed to be the result of adaptations produced by chronic use within the same neurotransmitter systems."[76] The use of heroin creates both positive and negative reinforcement through its processing within the brain. The heroin acts as an exogenous opiate within the brain and acts as a neurotransmitter for pleasure within the brain. The heroin produces a stronger pleasure reaction than endogenous opioids (endorphins and enkephalins).

The chronic use of exogenous opiates within the pleasure seeking system drives the need for the exogenous opiate and the opioid receptors are now only stimulated by the exogenous opiate rather than by natural pleasure stimuli. "Natural reinforcers such as food, drink, and sex [which] activate [pleasure] pathways in the brain [are replaced by the exogenous opiates] as surrogates of the natural reinforcers."[77] It is also believed that the use of these opiates and the negative reinforcement they produce (the need for the opiates to avoid pain due to lack of presence of the opiate) are aided by other natural occurring neurotransmitters in the brain, such

as dopamine and serotonin. Dopamine produces immediate feelings of pleasure and elation that reinforce certain behaviors such as eating or sex and motivates repetition of these activities.[78] Dopamine is believed to be produced with the use of opiates. "Serotonin is associated with the reinforcing effects of many abused drugs through its mood regulating and anxiety reducing effects. Low levels of serotonin are associated with depression and anxiety."[79] The lack of stimulation by opioid receptors are believed to be a cause for low levels of dopamine and serotonin. The lack of these two chemicals are thought to produce depression which intern produce the craving for the heroin to relieve feelings of depression and the restoration of feeling pleasure or at least feeling "normal."

This biochemical change within the brain is compounded by cognitive-behavioral issues, namely the cycle of addiction and compulsive and impulsive drug use. The cycle of addiction is started by positive reinforcement and then driven by negative reinforcement. Heroin produces a strong pleasure effect and cognitively the user decides to use the drug again to receive the same pleasurable effect. The opioid receptors of the brain become addicted to the presence of the heroin and then requires the heroin stimulation continuously. Here is where negative reinforcement takes control. The user no longer takes the heroin to feel pleasure, but takes heroin in order to feel "normal." The purpose in taking the heroin is to avoid painful sensations not to enjoy pleasurable sensations. During drug treatment the addict will desire to take heroin on two levels. Impulsive use will occur due to cues in the environment or by memories of taking the drug. The addict takes the drug *almost* without thinking about the consequences. Compulsive drug use occurs due to the addict obsessing over the pleasure gained by the drug. The addict thinks about the drug and the thoughts drive the addicts to relapse.

The use of naltrexone addresses the results of heroin use due to impulsive and compulsive behavior.[80] But the issue treatment programs need to contend with is the cognitive behavior of addicts in that they decide that life without heroin is not desirable and simply choose to stop taking the naltrexone so they can enjoy the pleasure of the heroin. The treatment therapy must create new cognitive pathways within the brain to allow for controlling of cravings for the heroin and behavior patters to deal with the social factors of their lives. Since human beings

have the ability to cognitively choose to do or not do something, drug treatment programs need to focus on how the individual addict handles life stressors and training the addict to resort to socially positive alternatives to stress reduction rather than resorting to the use of heroin.

- **The biochemical and cognitive-behavioral aspects of drug addiction presents the criminal justice system with political as well as social policy issues. The criminal justice system needs to contend with the implications of the fact that drug addicts have altered brain chemistry, while maintaining its inherent purpose of focusing on individual accountability and responsibility. Conversely, drug treatment designers and drug addiction scientists must contend with the fact that personal responsibility and accountability will always be a demand of policy makers and the public regardless of the science of addiction.**

It has been asserted that the prolonged drug use "causes pervasive changes in the brain [and] the addicted brain is distinctly different from the non addicted brain" and this fact leads to the conclusion that on general policy level "the addicted individual must be dealt with as if he or she is in a different brain state."[81] In other words, treat drug addicts as those whose minds have been "altered fundamentally by drugs."[82] Although the literature is settled on the fact that addiction causes changes in the brain, there is some debate on the cause of addiction. For example, O'Brien defined addiction as acts of "a chronic disease produced by thousands of exposures to drugs. Each drug taking episode activates specific brain structures, leaving a memory trace the persists long after the drug has disappeared from the body."[83] Goodman, explains that addiction is not formed by repeated use of a drug, but develops through a combination of environmental and genetic characteristics.[84]

Heyman, while agreeing that "changes in brain function alter voluntary behavior," notes that *addiction is still a behavior* of which social and economic costs can persuade addicts to end their addiction.[85] Heyman asserts that there are two types of addicts, those who take drugs voluntarily and those who do so involuntarily. The former can be persuaded cognitively but the later will "not be persuaded by costs and incentives to stop using them."[86] O'Brien, asserts that three factors should be kept in mind when considering addition and how to deal with addicts; (1) the availability of the drug and its cost and purity; (2) the genetic predisposition of the addict;

and (3) the applicable social and environmental pressures on the addict to continue or stop drug use.[87]

Although neuroscientists are convinced that addiction is a biological issue involving brain damage, "the more common view is that drug addicts are weak . . . unwilling to lead moral lives and to control their behavior and gratifications."[88] Although Leshner overstates the point, there is value in the common belief that human beings think and thus can control their behavior. The mere fact that one has damaged his/her brain and formed neuropathways for certain stimuli does not mean that the ability to choose has been destroyed. The fact that human beings have the ability to think, learn (form new neuropathways), and choose between behaviors seems to acknowledged as an afterthought by some of the literature on addiction. The political (used here to mean philosophy) view that behavior is a cognitively controlled activity that is at least equal in the cause and maintenance of addictive behavior needs to considered by treatment program designers and neuroscientists. Those who make political policy may not be aware or care about the science of addiction, especially if the idea of personal responsibility is not reflected in theories of addiction. For example, Congress has recently restricted social security payments and other social benefits from those who have drug addictions.[89]

Both the science of addiction and personal responsibility add to the issue of addiction and addiction treatment. As noted by Heyman, three factors should be kept in mind when trying to understand addiction; "[1] drug use in addicts can be altered by the proper arrangements of costs and benefits, [2] addictive drugs reduce options but do not eliminate choice, and [3] the biology of addiction is the biology of voluntary behavior."[90]

Endnotes

1 Office of National Drug Control Policy (1998). DATA SNAPSHOT: DRUG ABUSE IN AMERICA, 1998. Washington, D.C.: U.S. Printing Office at 32-33.

2 *Id.* In 1997, The number of chronic heroin users increased to 810,000. Office of National Drug Control Policy (1999). 1999 NATIONAL DRUG CONTROL STRATEGY. Washington, D.C.: Office of National Drug Control Policy at 30.

3 *Supra* note 1 at 40 - 41.

4 Office of National Drug Control Policy (1998). PULSE CHECK: NATIONAL TRENDS IN DRUG ABUSE SUMMER 1998. Washington, D.C.: U.S. Printing Office at *i.*

5 Drug Enforcement Administration and the National Guard (1997). DRUGS OF ABUSE 1997 EDITION. Washington, D.C.: U.S. Printing Office at 13.

6 *Id.*

7 *Id.* The DEA estimated that purity levels of heroin in 1981 was 7 percent and in 1998 the average purity rate is 41 percent nationwide. Parra, E. *Infra* note 16. The ingestion of heroin either by smoking or snorting has increased from 55% in 1994 to 71% in 1997. *Supra* note 2 at 30.

8 *Supra* note 4 at 4.

9 *Infra* note 11.

10 *Supra* note 4 at 3. "The hub of the area heroin trade [is in] the Kensington section of Philadelphia. That's where many Delaware addicts go to get [their heroin]. Through the first 10 months of 1998 [there were] 716 arrests for heroin" of which 30 were people from Delaware. *Infra* note 12 at A12.

11 New Castle County Police Heroin Alert Task Force (1998) "Heroin: The New Serial Killer That is Stalking Our Children" Presentation on September 26, 1998.

12 Feeney, T. and Parra, E. (1998). "Hooked on Heroin: Police sound the alarm". SUNDAY NEWS JOURNAL, (Nov. 29) A1 at A12.

13 *Id.* at A1.

14 *Id.*

15 *Supra* note 5 at 13.

16 *Supra* note 11. DEA investigations have discovered that heroin sold in Dover and Kent County originates in New York City. The heroin market in the U.S. is dominated by two sources, Columbia and Mexico. Columbian heroin is dominate along the east coast in cities like Boston, New York City, Newark, N.J., and Philadelphia. Columbian heroin averages at almost 68 percent pure but the Columbian heroin in Dover has been found in the high 90 percent range. The heroin purity rate in Dover has been found to be higher than in Philadelphia which is about 80 percent. The combination of the high purity rate of heroin in Delaware and the low cost is blamed for the increase of heroin use in suburban areas in Delaware. Parra, E. (1999). "Purity is part of the local problem". SUNDAY NEWS JOURNAL, (Jan. 21) A7. The dividing line between South American (high purity white) and Mexican (lower purity "black tar") heroin is the Mississippi river. Office of National Drug Control Policy (1999) *Supra* note 2 at 31.

17 SODAT - Delaware Inc. is a state licensed outpatient drug and alcohol treatment center, founded in 1970, and accredited by the Joint Commission for the Accreditation of Healthcare Organizations (JCAHO). SODAT is located at 625 N. Orange Street, Wilmington, Delaware 19801. SODAT has broadened its scope of activities from assisting teens with drug addition to adults. Thus it no longer uses the Services Overcome Drug Abuse Among Teens designation.

18 DB 95 - 17. Funds were made available through the Edward Byrne Memorial State and Local Law Enforcement Assistance Formula Grant Program.

19 DB 96 - 22 and DB 97 - 03.

20 *Supra* note 18 at 2.

21 *Supra* note 18 at 11. The goal statements remained the same for 1996 and 1997 funding.

22 DB 97-03, *Supra* note 19 at 10.

23 *Supra*, note 18 at 2.

24 *Id.*

25 *Id.*

26 *Id.*

27 *Id.*

28 *Id.*

29 STEDMAN'S MEDICAL DICTIONARY 25 EDITION (1990). Williams & Wilkins: Baltimore, MD.; Kaplan, H. & Sadock, B. (1995). COMPREHENSIVE TEXTBOOK OF PSYCHIATRY / VI VOL. 1 SIXTH EDITION. Williams & Wilkins: Baltimore, MD.; Ternes, J. and O'Brien, C. (1990). *The Opioids: Abuse Liability and Treatment for Dependence*, In ADDICTION POTENTIAL OF ABUSED DRUGS AND DRUG CLASSES, Carlton, E. (Ed.) The Haworth Press, Inc.: New York, New York, 27-45.

30 Kaplan, H. & Sadock, B., *Supra* note 29 at 844.

31 *Id.* "Heroin crosses the blood-brain barrier more rapidly than morphine and produces greater euphoric effects when given in equal doses. Once in the brain, heroin is hydrolyzed to morphine almost immediately." Terns, J &O'Brien, C., *Supra* note 29 at 31. Both heroin and morphine are derivatives of opium and as such are considered opiates.

Opiates attach to the opioid receptors of the brain and produce similar euphoric and pleasure reactions to natural occurring pain suppressants in the brain (endorphins and enkephalins) which also attach to the opioid receptors of the brain. Substance Abuse and Mental Health Services Administration (SAMSHA) (1998). NALTREXONE AND ALCOHOLISM TREATMENT: Treatment Improvement Protocol (TIP) series #28. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Substance Abuse and Mental Health Services Administration, Center for Substance Abuse Treatment at 28. Both endogenous opioids (endorphins and enkephalins) and exogenous opiates (heroin and morphine) act as neurotransmitters that transfer information through nervous system. In the case of opioid neurotransmitters, the information is pain relief and pleasure responses. See *Infra* note 42 for discussion on the cycle of addiction theory.

32 Kaplan, H. & Sadock, B., *Supra* note 29 at 844.

33 *Id.*.

34 *Id.* See also, *Infra* note 35 and Greenstein, R.; Resnick, R. and Resnick, E. (1984) *Methadone and Naltrexone in the Treatment of Heroin Dependence*, PSYCHIATRIC CLINICS OF NORTH AMERICA, 7(4) December, 671 - 679.

35 Kaplan, H. & Sadock, *Supra* note 29 at 844. For a review of early research on naltrexone in heroin addiction see, Resenick, R., Schuyten - Resnick, E., and Washton, A. (1979) *Narcotic Antagonists in the Treatment of Opioid Dependence: Review and Commentary*, COMPREHENSIVE PSYCHIATRY, 20(2) (March/April):116 - 125. See also, Julius, D. and Renault, P. (1976). NARCOTIC ANTAGONISTS: NALTREXONE, NATIONAL INSTITUTE ON DRUG ABUSE RESEARCH MONOGRAPH # 9. Washington D.C.: U.S. Dept. of Health, Education and Welfare, Public Health Service, Alcohol, Drug Abuse and Mental Health Administration, National Institute on Drug Abuse which encompasses 25 articles on naltrexone treatment studies for the first half of the 1970's that were funded by the U.S. Dept. of Health, Education, and Welfare, National Institute on Drug Abuse.

36 Greenstein, *et. al.*, *Supra* note 34 at 675; Terns, J and O'Brien, C., *Supra* note 29 at 43. See also, Navartnam, V., Jamaludib, A., Narayanasamy, R., Hohamed, M., et al. (1994). *Determination of naltrexone dosage for narcotic antagonist blockade in detoxified Asian addicts.* DRUG AND ALCOHOL DEPENDENCE February 34(3): 231 - 236 which found that naltrexone to be effective in blocking the physiological and psychological effects of heroin for at least 48 and 72 hours respectively. Opioid antagonists like naltrexone "block opioid receptors and reverse the effects of endogenous opioid peptides as well as exogenous opiates [and it is theorized that] these agents may prevent the reinforcing effects" of consumption of heroin. SAMHSA, *Supra* note 31 at 32.

37 Facts and Comparisons (1998). DRUG FACTS AND COMPARISONS 1998 EDITION. Facts and Comparisons: St. Luis, Missouri at 3579.

38 Kaplan and Sadock, *Supra* note 29 at 857. See, Wikler, A. (1973) *Dynamics of drug dependence: Implications of a conditioning theory for research and treatment*, ACHIEVES OF GENERAL PSYCHIATRY 28:611 - 616 and Wikler, A. (1965). *Conditioning factors in opiate addiction and relapse.* In NARCOTICS, Wilder, D. and Kassenbaum, G. (Eds.). New York, New York: McGraw-Hill, 85 - 100 for early work on the use of narcotic antagonists for treating heroin addiction. See also, Allen, K. (1998). *Essential concepts of addiction for general nursing practice.* NURSING CLINICS OF NORTH AMERICA 33(1): 1 - 13.

39 Kaplan and Sadock *Supra note* 29 at 857. See also, O'Brien, C., Childress, A., McLellan, T., Terness, J. and Ehrman, R. (1984). *Use of Naltrexone to extinguish opioid - conditioned responses.* JOURNAL OF CLINICAL PSYCHIATRY September 45 (9 sec. 2): 53-56.

40 See, Goldstein, A. (1976). *Naltrexone in the management of heroin addiction: Critique of the rationale.* In Julius, D. and Renault, P. (1976). NARCOTIC ANTAGONISTS: NALTREXONE, NATIONAL INSTITUTE ON DRUG ABUSE RESEARCH MONOGRAPH # 9. (158 - 161) Washington D.C.: U.S. Dept. of Health, Education and Welfare, Public Health Service, Alcohol, Drug Abuse and Mental Health Administration, National Institute on Drug Abuse at 159. See also, Resinick, *et al*, *Supra* note 35 and Resnick, R. and Schuyten-Resnick, E. (1976). *A point of view concerning treatment approaches with narcotic antagonists.* In Julius, D. and Renault, P. (1976). NARCOTIC ANTAGONISTS: NALTREXONE, NATIONAL INSTITUTE ON DRUG ABUSE RESEARCH MONOGRAPH # 9. (84 - 87) Washington D.C.: U.S. Dept. of Health, Education and Welfare, Public Health Service, Alcohol, Drug Abuse and Mental Health Administration, NIDA.

41 Goldstein, *supra* note 40 at 159. "Relapse to heroin use in abstinent ex-addicts is rarely cogitated and planned in advance. Conditioned abstinence ("craving") can be elicited by accidental encounters with active addicts . . . or other major stress." *Id.* On the issue of behavior, Goldstein noted that humans have the ability to "anticipate consequences and to modify our behavior accordingly. In this connection, the observation that naltrexone can diminish 'craving' is entirely understandable, since 'craving' is generally elicited by the possibility of obtaining a drug rather than by its unavailability. It follows from this analysis that naltrexone can only work if the patient understands how it works and believes that it will work." *Id.* at 159 - 160. Goldstein also asserted that because the patient knows that the naltrexone will block the affects of heroin and thus taking the drug will be futile, "it is not surprising that many subjects taking naltrexone may not use heroin to test and verify the protection." *Id.* at 159. For research showing that heroin addicts will test the blocking ability of naltrexone see *Infra* note 51. For a study looking at impulsive heroin addicts and self control, see Madden, G., Perry, N., Badger, G. and Bickel, W. (1997). *Impulsive and self-control choices in opioid-dependent patients and non-drug-suing control participants: drug and monetary rewards.* EXPERIMENTS IN CLINICAL PSYCHOPHARMACOLOGY. Aug; 5(3): 256 - 262. For a study looking at compulsive use of heroin and the opioid receptors and naltrexone, see Stewart, J. (1983). *Conditioned and unconditioned drug effects in relapse to opiate and stimulant drug self-administration.* PROGRESS IN NEUROPSYCHOPHARMACOLOGY AND BIOLOGICAL PSYCHIATRY 7(4-6): 591 - 597.

42 In the development of the cycle of addiction, the intake of heroin leads to an increase in opioid receptor activity. "Once opioid receptor activity has been primed, more [heroin] is needed to ensure continued opioid receptor activity. Therefore, a cycle may ensue during which the desire to increase or recapture feelings of pleasure or euphoria is translated into cravings for [the heroin]. The loss of control that follows the initial consumption of a reinforcing agent [the heroin] may provide the root mechanism for . . . addictive behavior." SAMHSA, *Supra* note 31 at 31 - 32. Thus the use of heroin can have a "priming" for additional use. The use of heroin, even a small amount, can effect a release of endorphins (which produce feelings of pleasure) which in turn increase the desire for more heroin which in turn produce more release of endorphins. Addiction research has found "that opiates can have an effect equal to that of having an appetizer before dinner. A small dose of a substance that effects the opiate receptor sites can increase the drive to consume more of the same." The first ingestion of the heroin increases the motivation to have another. Turner, A. (1995) NALTREXONE: THE MAGIC BULLET FOR ALCOHOLISM. www.enteract.com/~alturner/neltrexo.html. "This appetizer or priming effect provides good reason to look at opiate receptor blocking pharmacological agents in the battle to reduce relapse in early recovery." *Id.* See appendix for charts on the cycle of addiction and neuron communication. For a discussion on opiate receptor sites within the brain, see Wise, R. (1989). *Opiate reward: sites and substrates.* NEUROSCIENCE AND BIOBEHAVIORAL REVIEW (Summer-Fall); 13(2-3): 129 - 133 and Stewart, *Supra* note 41.

43 High drop out rates can be partially explained by the nature of addiction. As noted in endnotes 31 and 42, the consumption of heroin produces a pleasurable experience that can be stronger than natural pleasurable experiences. The experience in turn produces chemical reinforcers to the use of heroin. The reduction or stopping of the behavior (heroin use) produces the chemical reinforcers in the brain which in turn produce craving for the behavior (heroin use). The craving in turn produces the continuation of the behavior (heroin use). Negative reinforcement and addiction are achieved. Treatment programs using naltroxone block the pleasure reaction of opiates and opioids in the brain. But the psychological desire for the heroin and the resulting pleasure from using the drug causes the person to stop taking the naltrexone in order

to have the heroin have its desired effect. It is here that treatment modalities like cognitive therapy, group therapy, etc. can have an effect. For therapy addresses the emotional need for the heroin and how to resist the need.

44 Kaplan and Sadock, *Supra* note 29 at 857. See also, Shufman, E.; Porat, S.; Witztum, E.; Gandacu, D.; Bar-Hamburger, R. and Ginath, Y (1994). *The Efficacy of Naltrexone in Preventing Reabuse of Heroin after Detoxification*, SOCIETY OF BIOLOGICAL PSYCHIATRY 35: 935 - 945.

45 Shufman, *et. al.*, *Supra* note 42 at 939. "In this study, 75% of the patients stayed in the program after 1 month, and 58% completed the 3 months treatment period . . . ." *Id.*.at 942.

46 *Id.* at 942.

47 *Id.* at 939.

48 Reed, E. (1995). SODAT - DELAWARE, INC. SODAT NALTREXONE ALTERNATIVE PROGRAM (SNAP).

49 See, Stark, M. and Campbell, B. (1988). *Personality, drug use, and early attrition from substance abuse treatment.* AMERICAN JOURNAL OF DRUG AND ALCOHOL ABUSE 14(4): 475 - 485, O'Brien, C., Greenstein, D., Mintz, A. and Woody, G (1975). *Clinical Experience with Naltrexone.* AMERICAN JOURNAL OF ALCOHOL ABUSE 2: 365 - 377; Sideroff, S., Charuvaastra V., and Jarvik, M. (1978). *Craving in heroin addicts maintained on the opiate antagonist Naltrexone.* AMERICAN JOURNAL OF ALCOHOL ABUSE 5:415 - 423; Greenstein, R., O'Brien, C., McLellan, T., Woody, G., Grabowski, J., Long, M., Coyle, P., and Vittor, A. (1981) *Naltrexone: A short-term treatment for opiate dependence.* AMERICAN JOURNAL OF DRUG AND ALCOHOL ABUSE 8 (3): 291-300; Derogatic, L and Melisaratos, N. (1983). *The brief symptom inventory: An introductory report.* PSYCHOLOGICAL MEDICINE 13:595 - 605; Greenstein, R, Arndt, I., McLellan, T., O'Brien, C. and Evans, B. (1984) *Naltrexone: A Clinical Perspective.* JOURNAL OF CLINICAL PSYCHIATRY September 45 (9 sec. 2): 25-28; Kleber, H. and Kosten, T. (1984). *Naltrexone induction: psychological and pharmacological strategies.* JOURNAL OF CLINICAL PSYCHIATRY September 45 (9 sec. 2):29-38; Tennant, F., Rawson, R., Cohen, A., and Mann, A. (1984). *Clinical experience with Naltrexone in suburban opioid addicts.* JOURNAL OF CLINICAL PSYCHIATRY September 45 (9 sec. 2): 42 - 45; Gutierrez, M., Ballesteros, J., Gonzalez-Oliveros, R., and deApodaka, J. (1995). *Retention rates in two naltrexone programmes for heroin addicts in Victoria, Spain.* EUROPEAN PSYCHIATRY 10(4): 183-188.

50 O'Brien, C. and Greenstein, R. (1981). *Treatment approaches: Opiate antagonists.* In SUBSTANCE ABUSE: CLINICAL PROBLEMS AND PERSPECTIVES, Lowenson, J and Ruiz, P. (Eds.)Wiliams and Wilkins: Baltimore, Maryland, 403-407.

51 Tennant, F., *et al.*, *Supra* note 49; D'Ippoliti, D., Davoli, M., Perucci, C., Pasqualini, F., and Bargagli, A. (1998) *Retention in treatment of heroin users in Italy: the role of treatment type and of methadone maintenance dosage.* DRUG AND ALCOHOL DEPENDENCE October 52(2): 167 - 171. See also, Joe, G., Lloyd, M., Simpson, D.; et al., *Recidivism among opioid addicts after drug treatment: An analysis by race and tenure in treatment.* AMERICAN JOURNAL OF DRUG AND ALCOHOL ABUSE (1982-1983) 9:371-382.

52 Greenstein, *et al.*, *Supra* note 34 at 677. See also, Greenstein, *et al.*, *Supra* note 49 at 27. See *Supra* note 41 to the contrary.

53 See, Rabinowitz, J., Cohen, H., Tarrasch, R., and Kotler, M. (1997). *Compliance to naltrexone treatment after ultra-rapid opiate detoxification: an open label naturalistic study.* DRUG AND ALCOHOL DEPENDENCE August 47(2): 77 - 86; Neto, D., Xavier, M., Aguiar, P., David, M., Sardinha, L and deAlmaida, C. (1997) *Sequential combined treatment of heroin addicted patients in Portugal with naltrexone and family therapy.* EUROPEAN ADDICTION RESEARCH July 3(3): 138 - 145, Robson, P. and Bruce, M. (1997). *A comparison of 'visible' and 'invisible' users of amphetamine, cocaine and heroin: two distinct populations.* ADDICTION Dec; 92(12): 1729 - 1736, Gossop, M., Griffiths, P., Powis, B. and Strang, J. (1992). *Severity of dependence and route of administration of heroin, cocaine and amphetamines.* BRITISH JOURNAL OF ADDICTION Nov; 87(11): 1527 - 1536 and Washton, A., Gold, M., and Pottash, A. (1984). *Successful use of naltrexone in addicted physicians and business executives.* ADVANCES IN ALCOHOL AND SUBSTANCE ABUSE 4(2): 89 - 96. See also, *Infra* notes 54. For the assertion that there is a distinction between compulsive / addictive users of heroin from non addictive, long term moderate users of heroin see, Harding, W. (1983). *Controlled opiate use: fact or artifact?* ADVANCES IN ALCOHOL AND SUBSTANCE ABUSE (1993 - 1994 Fall - Winter); 3(1-2): 105 - 108.

54 See, Roth, A., Hogan, L, and Farren, C. (1997). *Naltrexone plus group therapy for treatment of opiate-abusing health care professionals.* JOURNAL OF SUBSTANCE ABUSE TREATMENT 14(1): 19 - 22; Ling, W. and Wesson, D. (1984). *Naltrexone treatment for addicted health care professionals: A collaborative private practice experience.* JOURNAL OF CLINICAL PSYCHIATRY September 45 (9 sec. 2):46-48; Washton, A., Pottask, A. and Gold, M. (1984). *Naltrexone in addicted business executives and physicians.* JOURNAL OF CLINICAL PSYCHIATRY September 45 (9 sec. 2): 39- 41; Gonzalez, J. and Brogden, R. (1988). *Naltrexone: A review of its pharmacodynamic and pharmacokinetic properties and therapeutic efficacy in the management of opioid dependence.* DRUGS Mar. 35(3): 192 - 213; Resnick,

Schuyten-Resnick and Washton, *Supra* note 35. See also, Office of National Drug Control Policy (1996). WHITE PAPER: TREATMENT PROTOCOL EFFECTIVENESS STUDY. Office of National Drug Control Policy: Washington, D.C.; McLellan, A. (1983). *Patient characteristics associated with outcome.* In RESEARCH ON TREATMENT OF NARCOTIC ADDICTION. Cooper, J. (Ed.). United States Department of Health and Human Services: Washington, D.C. p. 500 - 529.

55 See, Resnick, Schuyten-Resnick and Washton, *Supra* note 35. See also, Resnick, R., Funk, M. and Fredman, A. (1970). *A cyclazocine typology in opiate dependence.* AMERICAN JOURNAL OF PSYCHIATRY 126: 1256 - 1260; Resnick, R. and Washton (1978). *Clinical outcome with naltrexone: Predictor variables and follow-up status in detoxified heroin addicts.* ANNALS NEW YORK ACADEMY OF SCIENCE 311: 241 - 246.

56 DeLeon, G. and Jainchill, M. (1986). *Circumstances, Motivation, Readiness and Suitability as correlates of Treatment Tenure.* JOURNAL OF PSYCHOACTIVE DRUGS 18(3): 203 - 208.

It has been asserted that treatment programs are destined for failure because they don't consider the multifaceted factors of why is the treatment is being offered, the difference between treatment and therapy, why an addict is seeking treatment, who is offering the treatment, and why the addict has an addiction. Additionally, the lack of specific and meaningful goal setting for the individual addict, the lack of specific diagnosis of the individual addict, the confusion of goals to help the addict become an effective patient with goals to make the patient a better citizen by improving his/her lifestyle, and confusing different theories of therapy and treatment modalities all help to create program design problems that lead to failure. See, Einstein, S. (1980). *Factors Initiating / Affecting the Treatment of Drug Use and the Drug User.* THE INTERNATIONAL JOURNAL OF THE ADDICTIONS 15(6): 773 - 794.

57 Ben-Yehuda, N. (1981). *Success and Failure in Rehabilitation: The Case of Methadone Maintenance.* AMERICAN JOURNAL OF COMMUNITY PSYCHOLOGY 9(1): 83 - 107. It has also been observed that since treatment programs generally are not evaluated using random selection of patients and control groups, establishment of baseline measurements, and have reliability and validity limitations, the fact of high attrition rates should not be the sole assessment of success. Berg, W. (1992). *Evaluation of Community-Based Drug Abuse Treatment programs: A review of the literature.* In Freeman, E. (Ed). THE ADDICTIVE PROCESS: EFFECTIVE SOCIAL WORK APPROACHES (81 - 95). New York, N.Y.: Longman.

58 Berg, *Supra* note 57 at 84.

59 *Id.*

60 Ben-Yehuda, *Supra* note 57 at 85.

61 *Id.* at 86.

62 DeLong and Jainchill, *Supra* note 56. For two theories on the readiness to change and its impact on behavior change see, Prochaska, J., Johnson, S. and Lee, P. (1998). *The transtheoretical Model of Behavior Change.* In Shumaker, S., Schron, E., Ockene, J., and McBee, W. (Eds) THE HANDBOOK OF HEALTH BEHAVIOR CHANGE SECOND EDITION (59 - 84). New York, NY: Springer Publishing Company; and Grunberg, N., and Klein, L. (1998). *Biological Obstacles to Adoption and Maintenance of Health-Promoting Behaviors.* In Shumaker, S., Schron, E., Ockene, J., and McBee, W. (Eds) THE HANDBOOK OF HEALTH BEHAVIOR CHANGE SECOND EDITION (269 - 282). New York, NY: Springer Publishing Company.

63 Ben-Yehuda, *Supra* note 57. " Future - oriented patients apparently benefit most from their therapeutic experience in the program. This classification [has] important implications . . . . Upon admission . . . patients could be classified . . . with immediate implications as to the behavior expected of them while [in] the program. This information could potentially help clinical and administrative personnel working with drug-abuse to better deal with their patients, construct differential treatment plans for them, and assess success more meaningfully." *Id.* at 97.

64 DeLong and Jainchill, *supra* note 56. A positive motivation is " a desire to forge a new lifestyle; a belief that one can be successful and have the good things in life; or a desire for personal growth, to be a better person . . . as well as to have healthier relationships." *Id.* at 203.

65 Prochaska, *et. al.*, *Supra* note 62. In the preparation stage " people are intending to take action in the immediate future, usually measured as during the next month. These individuals have a plan of action . . . . These are the people we should recruit for . . . action-oriented programs." *Id* at 61.

66 el-Mallakh, P. (1998). *Treatment models for clients with co-occurring addictive and mental disorders.* ACHIEVES OF PSYCHIATRIC NURSING April, 12(2): 71 - 80.

67 *Id.*

68 Ross, H., Cutler, M, and Sklar, S. (1997). *Retention in substance abuse treatment. Role of psychiatric symptom severity.* AMERICAN JOURNAL OF ADDICTION Fall, 6(4): 293 - 303.

69 Tidey, J., Mehl-Madrona, L, Higgins, S., and Badger, G. (1998). *Psychiatric symptom severity in cocaine-dependent outpatients: demographics, drug use characteristics and treatment outcome.* DRUG ALCOHOL DEPENDENCE March 1, 50(1): 9 - 17.

70 Russo, J., Roy-Byrne, P., Jaffe, C., Ries, R., Dagadakis, C., and Avery, D. (1997). *Psychiatric status, quality of life, and level of care as predictors of outcomes of acute inpatient treatment.* PSYCHIATRIC SERVICE November, 48(11): 1427 - 1434.

71 Rapaka, R. and Sorer, H. (1995). *Introduction.* In DISCOVERY OF NOVEL OPIOID MEDICATIONS, NATIONAL INSTITUTE ON DRUG ABUSE RESEARCH MONOGRAPH # 147. Rapaka, R. and Sorer, H. (Eds). Rockville, MD: U.S. Department of Health and Human Services, Public Health service, National Institutes of Health, National Institute on Drug Abuse at V.

72 Miller, W. and Brown, S. (1997). *Why psychologists should treat alcohol and drug problems.* AMERICAN PSYCHOLOGY December, 52(12): 1269 - 1279.

73 Leshner, A. (1997). *Addiction is a brain disease, and it matters.* SCIENCE 278 October: 45 - 47 at 46.

74 See, *Supra* notes 31, 41 - 43.

75 SHAMSHA, *supra* note 31 at 27.

76 *Id.*

77 *Id.*

78 *Id.* at 28.

79 *Id.*

80 See, *Supra* notes 37 - 41 and accompanying text.

81 Leshner, *Supra* note 73 at 46. See also, Koob, G., Sanna, P., and Bloom, F. (1998). *Neuroscience of addiction.* NEURON 21: 467 - 476. Some recent research has asserted that addiction can be traced to genetics, see Kosten, T. (1997). *Addiction as a brain disease.* AMERICAN JOURNAL OF PHYCHIATRY 155(6): 711 - 713.

82 Leshner, *Supra* note 73 at 46.

83 O'Brien, C. (1997). *Progress in the Science of Addiction.* AMERICAN JOURNAL OF PSYCHIATRY 154(9): 1195 - 1197, at 1195. O'Brien asserted that

> Drug exposures . . . paired with environmental cues (persons, places, things) . . . acquire the ability to activate the same or complementary brain circuits even in the absence of the drug. *Id.*
> Drug-related cues alone have [been shown to produce] increases in limbic blood flow in formerly dependent cocaine users . . . . Drug cues have also produced increases in the metabolism of specific brain areas. *Id.* at 1196.

This explains why addiction is considered to be a chronic disease. Although the use of drugs has ended, pathways and brain chemistry have been altered so as to produce the effects of the "disease" although the agent causing the disease is no longer present. Although this chemical analysis may be true, the choice of whether to indulge in an impulse or compulsive need (chemically created or not) is not destroyed. One still chooses to indulge a desire and one chooses to frequent an area that provides those cues of addiction.

84 Goodman, A. (1998). *Science of Addiction* (letter to the editor). AMERICAN JOURNAL OF PSYCHIATRY 155(11): 1642, at 1642. Goodman goes on to say the following:

> I would describe addiction as a chronic condition that develops through a process that involves complex interactions over tome between genetic and environmental factors. More specifically, I would propose that two sets of determinants are involved in the development of an addictive disorder: 1) those that concern underlying neurobiological abnormalities that are shared by all addictive disorders and 2) Those that relate to the selection of a particular substance as the one that is preferred for addictive use. I would add that each set includes both genetic and environmental factors. Environmental factors in The development of the underlying neurobiological abnormalities include deficiencies in the child's caregiving environment during the first years of life, when the maturing brain is most sensitive to external influences and depends on particular qualities of interchange with the caregiving environment for healthy development. Genetic factors in selection include genetically based variations in 1) the sensitivity of the reward system to different substances, 2) the body's sensitivity to immediate aversive consequences of using a substance (such as flushing or standing ataxia after ingestion of alcohol), and 3) the intensity of the individual's sensitivity to various painful affects [which is] associated with . . . negative reinforcement.

85 Heyman, G. (1997). *On the Science of Substance Abuse* (Editorial). SCIENCE 278(5335): 15 - 16.

86 *Id.* at 15.

87 O'Brien, C. (1998). *Dr. O'Brien Replies* (letter to the editor in response to Dr. Goodman). AMERICAN JOURNAL OF PSYCHIATRY 155(11): 1642 - 1643. See Goodman, *Supra* note 84.

88 Leshner, A. *Supra* note 81 at 45.

89 See, Gresenz, C., Watkins, K., and Podus, D. (1998). *Supplemental Security Income (SSI), Disability Insurance (DI) and Substance Abusers.* COMMUNITY MENTAL HEALTH JOURNAL 34(4): 337 - 350.

90 Heyman, G. *Supra* note 85 at 16.

Appendix:
Additional references on naltrexone, heroin treatment, and general drug treatment

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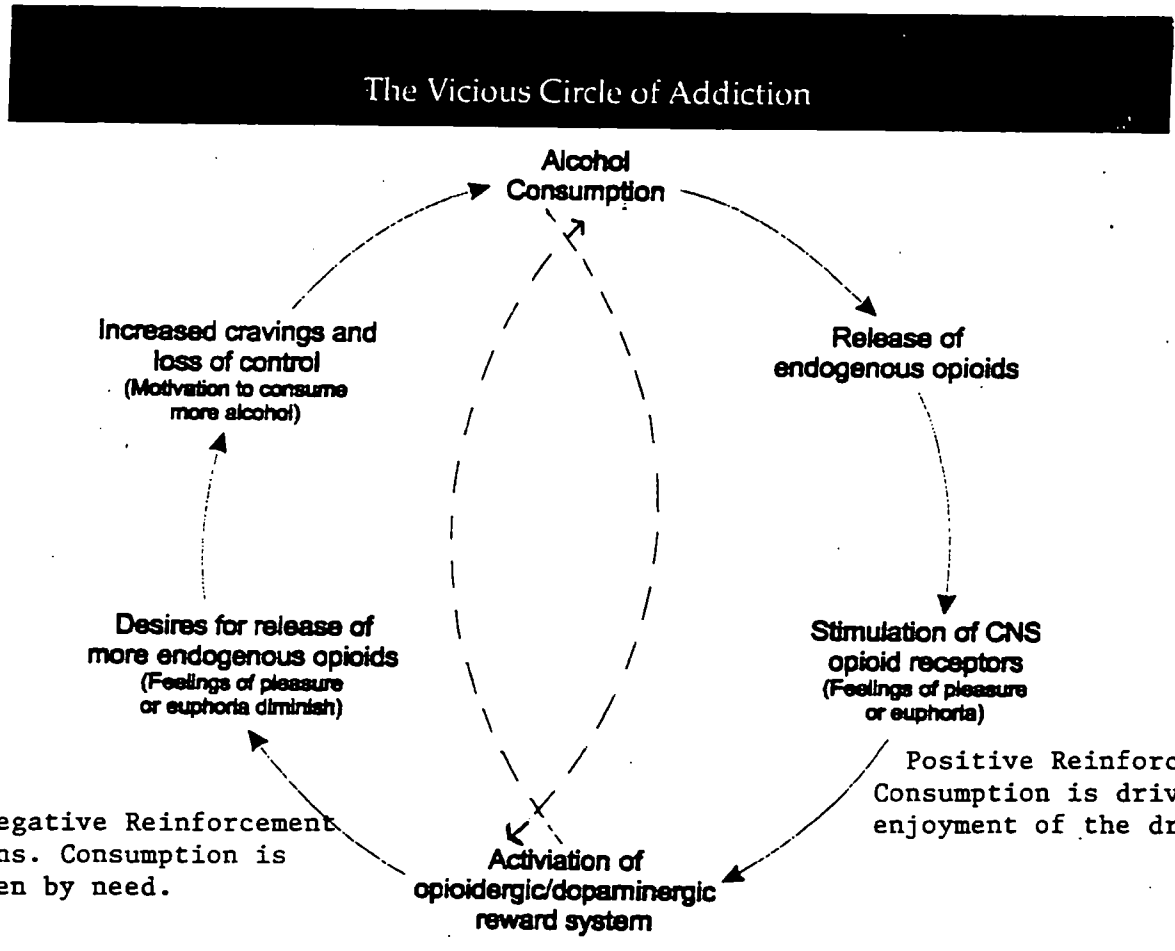
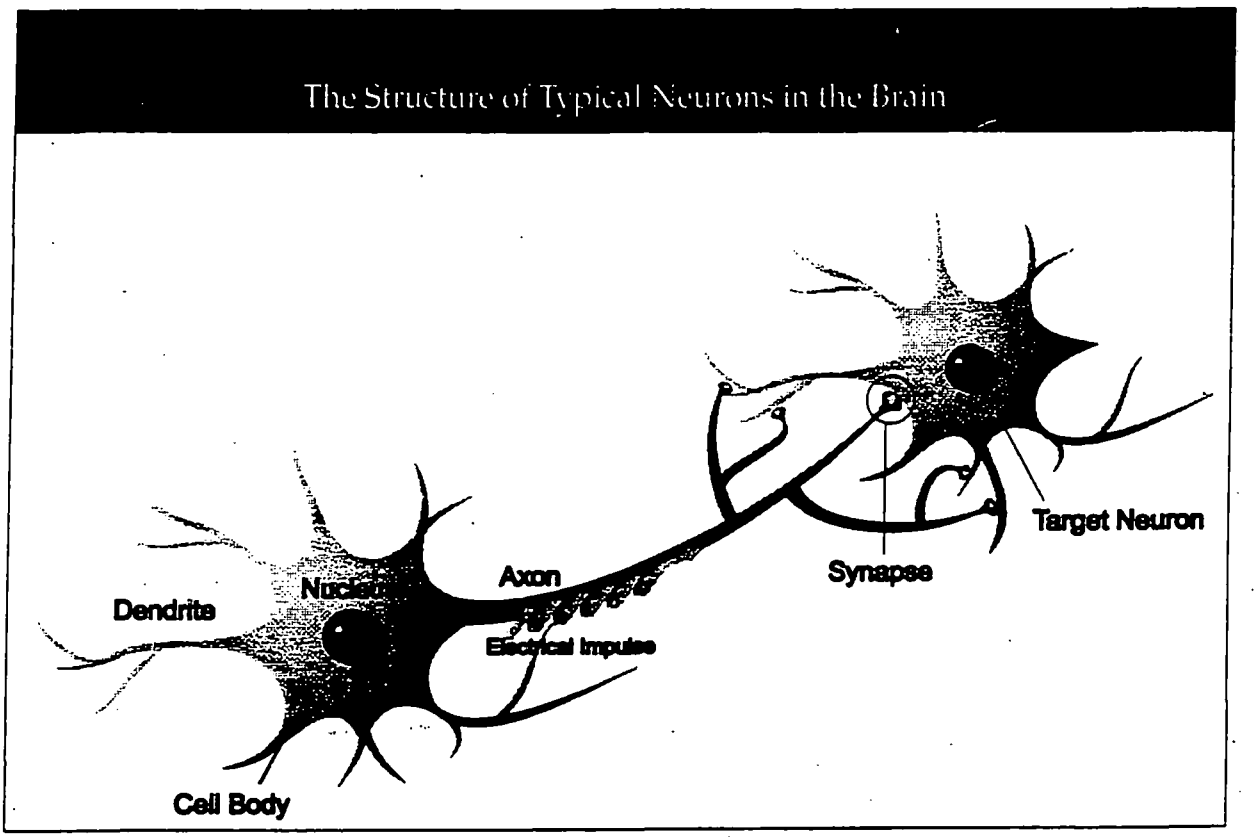
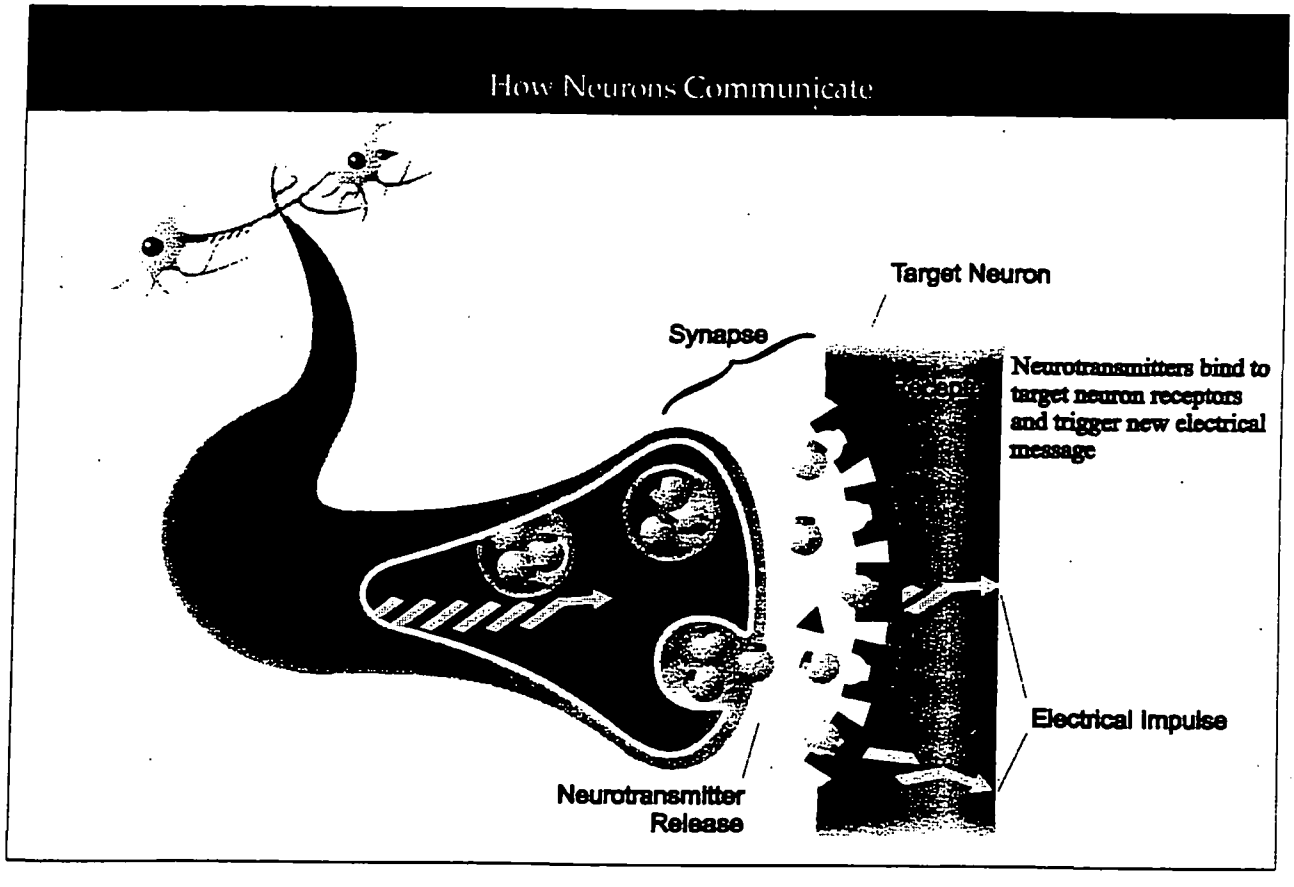
Appendix:
Charts on the cycle of addiction and neuron communication



Source: Chart adapted from Substance Abuse and Mental Health Services Administration (SAMSHA) (1998). NALTREXONE AND ALCOHOLISM TREATMENT: Treatment Improvement Protocol (TIP) series #28. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Substance Abuse and Mental Health Services Administration, Center for Substance Abuse Treatment at 31.



Source: Substance Abuse and Mental Health Services Administration (SAMSHA) (1998). NALTREXONE AND ALCOHOLISM TREATMENT: Treatment Improvement Protocol (TIP) series #28. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Substance Abuse and Mental Health Services Administration, Center for Substance Abuse Treatment at 26.



Source: Substance Abuse and Mental Health Services Administration (SAMSHA) (1998). NALTREXONE AND ALCOHOLISM TREATMENT: Treatment Improvement Protocol (TIP) series #28. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Substance Abuse and Mental Health Services Administration, Center for Substance Abuse Treatment at 27.