

# HEROIN:

## Challenge for the 21st Century

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**CARON**  
FOUNDATION

Excellence In Addiction Treatment

2001



Excellence In Addiction Treatment

*The Caron Foundation is a not-for-profit organization with a mission to provide an enlightened and caring treatment community in which those affected by the disease of addiction may begin a new life.*

*Since 1957, the Caron Foundation has helped more than 60,000 adults and adolescents recover from the pain of addiction and rebuild their lives.*

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# Forward

Doug Tieman, President and CEO



The “heroin epidemic” has certainly caught the attention of the American public over the past five years. Unfortunately, when something like this happens, much of the information about the reality of the situation is based upon perception, anecdote, media hype and generalization. Like everyone in the treatment field, Caron Foundation was ill-prepared for the dramatic increase of heroin patients that we began to see some four years ago. As a result, not unlike other treatment facilities, Caron had unexpected difficulties in retaining these patients for treatment.

However, as an institution that is committed to the highest quality care for all of its patients, Caron invested in research, expertise, medical advances and innovation. This commitment, as you will note in this report, has provided Caron with extensive information about the heroin addict, but more importantly, has led to significant improvements in the treatment of this patient. We have seen the percentage of heroin patients leaving prematurely during detoxification and rehabilitation programs decrease dramatically. More importantly, we have seen the length of treatment stay for our heroin patients increase to levels that are consistent with patients addicted to other substances.

The length of treatment stay is a critical measurement — we know from studies that the longer patients are in treatment the higher their recovery rate. In other words, Caron has been able to address the specific nuances of the heroin-addicted patient and focus treatment on the individual, so that there is no difference in the treatment process for heroin-addicted patients when compared to other chemically dependent patients.

You will find extensive information in this report about the biological, psychological and social issues surrounding heroin, heroin use, its pharmacological impact and various treatment protocols. Caron has taken data from the research material and incorporated it into its ever-improving treatment protocol. One important message heard in the report is that when appropriately treated, heroin addiction can have the same type of positive outcome leading to a sober and productive lifestyle.



Doug Tieman,  
President and CEO

## About the Author Susan M. Gordon, Ph.D.

Susan M. Gordon, Ph.D. is Director of Research at the Caron Foundation, one of the top chemical dependency treatment centers in the United States to offer a complete continuum of care for adolescents and adults. Dr. Gordon has more than nine years experience in counseling and psychological evaluation of chemical addictions and mental health issues. She has worked extensively with women and adolescents.

Dr. Gordon previously was the Clinical Administrator of a residential facility for the treatment of eating disorders. She has conducted research and treatment in chemical addictions at the University of Pennsylvania Treatment Research Center.

Since 1986, Dr. Gordon has lectured and conducted seminars and workshops concerning drug use and mental health issues. She also has taught courses in Developmental Psychology and Psychology of Women at the university level.



# Heroin: Challenge for the 21st Century

## *Profiles of Addiction*

News headlines over the past few years jolt us into the realization that heroin is no longer a problem only for aging addicts in the inner cities. A new epidemic has crossed generational, socioeconomic, and geographic divides to plague all sections of American society, from the cities to suburbs and rural areas and from adults to adolescents and young children.

- A couple who had been married for 18 years found themselves living in a homeless shelter far from their prior middle-class suburban life, because of their addiction to heroin. Their many losses include their three children, their two homes, his job, their cars and other possessions. Their road to addiction also included arrests for drug dealing as well as repeatedly being victimized by muggers<sup>[1]</sup>.
- Three friends from a small private college carried their roommate to the local emergency room where he was declared dead. When police searched their dormitory room, they found another student, unconscious from an overdose of heroin and prescriptions pills that killed his friend. Two other students also received emergency treatment that night for overdosing. The survivors now face charges for felony drug possession – this was not the curriculum or “resume” they had planned when they entered college<sup>[2]</sup>.
- A suburban 15-year old boy moved from marijuana to cocaine to heroin. The next four years of addiction found him stealing thousands of dollars from his family and committing armed robbery to finance his addiction<sup>[3]</sup>.

## *Trends in Heroin Use*

Historically, whites as well as other ethnic and racial groups in the United States have abused heroin. From the 1950's to the 1980's heroin addiction began to spread in Harlem among African-American males, and this aging cohort continues to constitute a large number

of people who require treatment today<sup>[4]</sup>. In the 1990s heroin again appeared in epidemic form – this time among younger white middle-class users<sup>[4]</sup> and Hispanic-Americans<sup>[5]</sup>.

## **Purer, Less Expensive Heroin**

The rise of heroin use in the 1990's is attributed to an increase in snorting and smoking heroin as opposed to earlier epidemics that relied on intravenous (IV) use. The availability of inexpensive, very pure heroin allows users to sniff or smoke it. Purity is determined by the percentage of heroin in the substance sold to users. Heroin often is combined or “cut” with other substances that reduce its potency, such as sugar, starch, powdered milk, quinine, or poisons, such as strychnine<sup>[6]</sup>. In 1995, the Drug Enforcement Administration reported small retail purchases of heroin were 59% pure compared to 37% pure in 1992<sup>[7]</sup>. In 1999 heroin in Philadelphia was reported to be 71% pure<sup>[3]</sup>.

The increase in purity is due to shifts in the international drug market from earlier Southeast Asian centers of heroin production and distribution to more recent Colombian sources for heroin<sup>[3]</sup>. Also, heroin production has doubled since the mid-1980's, resulting in greater availability and lower prices around the world<sup>[8]</sup>. The lethal potency of the new heroin can be seen by its street names: Killer, DOA, Death, Body Bag, and Silence of the Lambs<sup>[3,4]</sup>.

## **Younger, More Affluent Users**

It is estimated that there are approximately eight million heroin abusers around the world<sup>[8]</sup>. Approximately two million people use heroin in the United States and 600,000 to 800,000 of these users are addicted to the drug<sup>[8]</sup>.

National surveys of substance abuse strongly suggest that most new users of heroin are young. According to the 1999 National Household Survey on

Drug Abuse (NHSDA)<sup>[9]</sup>, a quarter of the new users were under age 18 and 47% were age 18 to 25 at their first use. This trend of young users is confirmed by the 2000 Monitoring the Future Study,<sup>[10]</sup> a national study of high school students, which found that 10.6% of high school seniors have tried heroin at least once in their lifetime and 1.5% had used it in the past year, resulting in the highest rate of heroin use among 12th graders since the survey began.

A review of clinical charts of adolescents in treatment for heroin addiction at the Caron Foundation Adolescent Center in 1999<sup>[11]</sup> found that the average age of patients was 17.3 years. The patients ranged in age from 14 through 19 years. The review also found that boys were using an average of six bags of heroin a day immediately prior to admission and girls were using an average of four bags a day. Adolescent patients had been using heroin for an average of 13 months prior to admission, although prior use ranged from one to 60 months.

Another research project at the Caron Foundation surveyed adult heroin addiction patients about demographic characteristics and the patients' drug use histories<sup>[12]</sup>. As shown in **Figure 1**, patients were likely to be young, with almost 75% under the age of 35. On average, people admitted to an adult program in 1999<sup>[13]</sup> at Caron for treatment of heroin were 10 years younger (average age of 29 years) than people admitted for other drug or alcohol treatment (average age of 39 years).

The average age of first heroin use for the adult patients<sup>[12]</sup> was 21 years, ranging from 13 to 42 years of age. Initiation to heroin was most likely to occur at 17 (15.6%) or 18 (18.6%) years of age. These adult patients had been using heroin on a daily basis prior to admission. They reported an average of six days a week of use, with most patients (82.4%) using seven days of the week.

Other demographic statistics about Caron Foundation heroin-addicted patients point to racial and socioeconomic shifts in heroin use to middle-class users that were noted in 1991 by the federal government<sup>[4]</sup>. Almost 90% of admissions to Caron adult treatment programs<sup>[12]</sup> were white, over 50% were employed full-time, and almost 89% had a high school diploma or higher level of education as can be seen in **Figures 2, 3** and **4**. Over 70% of adolescent admissions lived in suburban or rural locales<sup>[11]</sup>.

Figure 2: Race of Heroin Addicted Patients

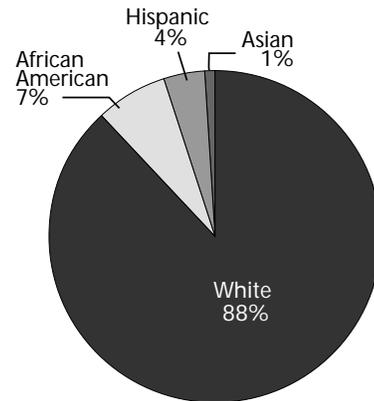


Figure 1: Age of Heroin Addicted Patients

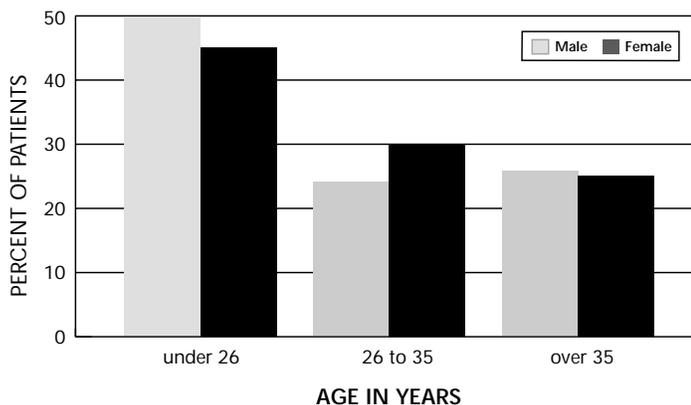


Figure 3: Employment Status of Heroin Addicted Patients

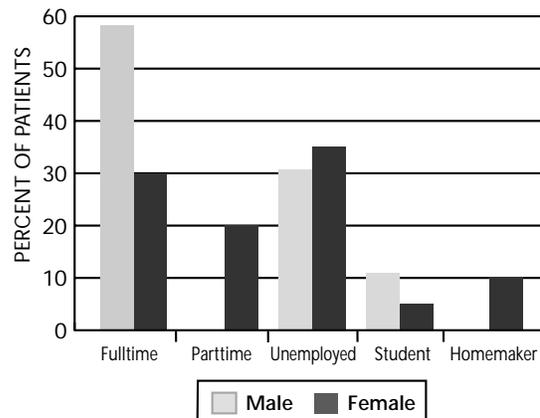
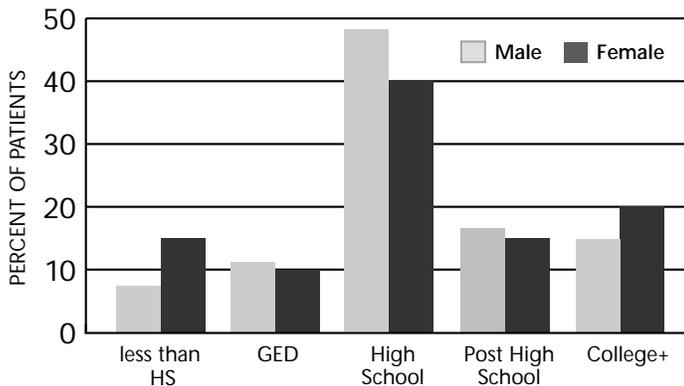


Figure 4: Education of Heroin Addicted Patients



### Gender Trends

Recent national statistics<sup>[9]</sup> indicate that males (2.0% of the American population) are more likely to be addicted to drugs than are females (1.3%), although there are no gender differences between adolescents (3.3% for males and females). These gender trends are also seen at the Caron Foundation. There were very minor differences between adolescent male (52%) and female (48%) admissions<sup>[11]</sup>.

However, the disparity between Caron Foundation adult male and female admissions for heroin addiction is much higher than the national estimate of drug addiction. Males accounted for over 73% of the heroin survey respondents, compared to almost 27% female respondents who were admitted for the same time period<sup>[12]</sup>. These differences reflect the national trend for men to comprise approximately 70% of treatment slots. Only time will tell if today's female adolescent heroin users will access treatment on an equal basis to males as the new generation of heroin addicts matures into adulthood.

## Heroin's Appeal and Threat

### Heroin and the Brain

Opium, a drug processed from the poppy plant, has been used and abused for centuries. Other drugs that are extracted from opium are called opiates. Synthetically produced opiates are called opioids. It was not until the early 1800's that morphine, a power-

ful opiate, was isolated from the poppy. As morphine's addictive properties became known, the search began for a substitute pain relief medication. Heroin, the most rapidly acting of the opiates, was processed from morphine to provide an alternative to morphine's addictive properties. By the early 1900's the powerfully addictive features of heroin had become apparent and the Harrison Narcotics Act<sup>[4]</sup> outlawed it, along with other harmful drugs.

Heroin acts much more quickly than other opiates and induces a powerful and intense short-term feeling of pleasure and euphoria, known as a "rush." Following the initial rush, heroin then produces a relaxed state that lasts for a few hours. Other short-term effects that are not as pleasant include a warm flushing to the skin, dry mouth, nausea, vomiting, constipation, and severe itching, and longer-acting negative effects include impaired mental functioning, impaired cardiac functioning, and severely decreased respiratory effect that can cause death<sup>[4,6]</sup>.

Heroin achieves these effects after it travels to the brain through the bloodstream by injection, smoking or inhaling the drug. Once in the brain, heroin converts to morphine and attaches to certain opiate receptors, the mu receptors, found in regions of the brain. Similar to other drugs of abuse, heroin effects the release of an important chemical, dopamine, in the brain. The chronic increase of dopamine levels appears to be related to the addictive properties of the drug<sup>[4]</sup>. However, the pharmacology of heroin addiction is complex, and tolerance and dependence produce a variety of neurochemical and molecular changes in the brain<sup>[4,6]</sup>.

### Intravenous Versus Intranasal Use

Many new users of heroin are introduced to the drug through snorting or intranasal use<sup>[6,7]</sup>. Heroin users tend to snort or smoke heroin if they live in or near areas of high heroin purity, while they tend to use intravenously (IV) in areas of lower purity<sup>[4]</sup>. Less than 40% of Americans who first used heroin from 1996 through 1998 acknowledged injecting it<sup>[9]</sup>.

New users often have the misperception that snorting heroin is safe because they think it is not addictive

if taken in that way. However, since all methods of heroin ingestion follow the same brain pathway, they are equally addictive. Users also may turn to snorting because intranasal use does not involve needles and lessens the chance of becoming infected with hepatitis or HIV.

However, the dangers associated with intravenous use soon become known to users because once addicted, many users shift from intranasal use to injecting heroin. Intravenous use produces the quickest rush (seven to eight seconds) while snorting and smoking show effects within 10 to 15 minutes of use<sup>[6]</sup>. As seen in **Figure 5**, at the Caron Foundation we have found that many patients have turned from their first use of snorting heroin to using intravenously prior to coming into treatment<sup>[12]</sup>.

Research conducted on a sample of men and women in treatment for heroin addiction in London<sup>[14]</sup> found that the men (70%) were more likely to use intravenously than were the women (58%). These statistics on IV usage are remarkably similar to those reported by the Caron Foundation patients. However, at Caron there were much fewer gender differences reported in how heroin was administered for the first time.

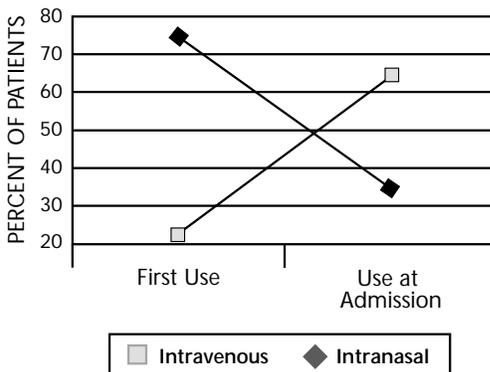
Younger patients in Caron's Adolescent Center<sup>[11]</sup> also were more likely to use intravenously (56.5%) than by snorting (38.9%) or smoking (3.7%) heroin. Adolescent IV users also were more likely to have used heroin for a longer period (average of 17 months) than were adolescents who snorted heroin (average of 10

months). In addition, we found the adolescent IV users to be slightly older (average of 17.6 years) than were the intranasal users (average of 17 years).

A community sample of heroin users in England<sup>[15]</sup> found similar use patterns, despite demographic and socioeconomic differences between this sample and the Caron Foundation patients. The group of British users who only inhaled heroin ("chasing the dragon") were younger and had used heroin for less time than the IV users. More than one third of the total sample had transitioned from inhaling heroin to injecting. Women were less likely to transition to injection than were men. Health risks of addicts who injected heroin also were identified – addicts who had always used heroin intravenously were the ones who were most likely to test positive for HIV and hepatitis B.

Another survey of adults in detoxification treatment for heroin in the United States<sup>[16]</sup> compared intranasal users who had never used intravenously to injectors who may have snorted heroin in the past, but who used intravenously only at the time of the research. Intravenous users in this sample used significantly more other drugs than did intranasal users. They were more likely than snorters to have begun drinking alcohol at an earlier age, to use alcohol heavily for a longer period, and to abuse cocaine. Intravenous users also experienced more drug overdoses in their lifetimes than did snorters. Both IV and intranasal users made significant progress in treatment and both groups had similar relapse rates – attesting to the benefits of treatment as well as to the addictive properties of intranasal heroin use.

**Figure 5: First Heroin Use vs. Use at Admission**



### Heroin and Multi-Drug Use

Estimates of multi-drug use among heroin-addicted people range from 30 to 70%<sup>[17]</sup>. The most common co-occurring addictions are cocaine, benzodiazepines, alcohol, nicotine and marijuana<sup>[7,18]</sup>. Rates of marijuana use by heroin addicts seeking treatment have been reported to be as high as 66%<sup>[17]</sup>.

Combining the use of heroin and cocaine, such as by snorting heroin and smoking crack cocaine, has

become prevalent among cocaine users, especially in the New York area<sup>[7]</sup>. Although this combination may be used by people addicted to cocaine in order to ease the agitation associated with cocaine use<sup>[7]</sup>, repeated use of heroin often induces an addiction to heroin.

As seen in **Figure 6**, adult patients at the Caron Foundation<sup>[12]</sup> acknowledged high rates of cocaine and alcohol use when they first started using heroin. However, heroin appears to be a drug that controls the user by decreasing his or her desire for other drugs. This trend toward decreasing multi-drug use is illustrated in **Figure 7**. When heroin-addicted patients at the Caron Foundation first tried heroin they were using an average of four other drugs, but significantly tended to decrease their drug usage to an average of 1.8 other drugs at the point when they most recently were admitted for treatment.

Adolescents at the Caron Foundation Adolescent Center<sup>[11]</sup> also acknowledged using an average of 1.8 other drugs at their time of admission. The drugs they most frequently used in addition to heroin were nicotine (92%), marijuana (41.7%), cocaine (13%), alcohol (9.3%), and other opioids (9.3%).

### Dependence Versus Addiction

Dependence on heroin occurs with repeated use for most people. The receptors affected by heroin adapt to it and function normally only when the drug is present. When there are insufficient amounts of opiates in the brain, withdrawal occurs, often within a few hours of the last use.

Figure 6: Use of Other Drugs

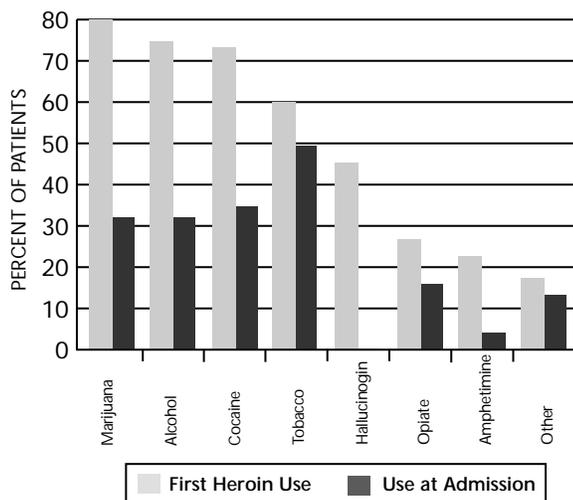
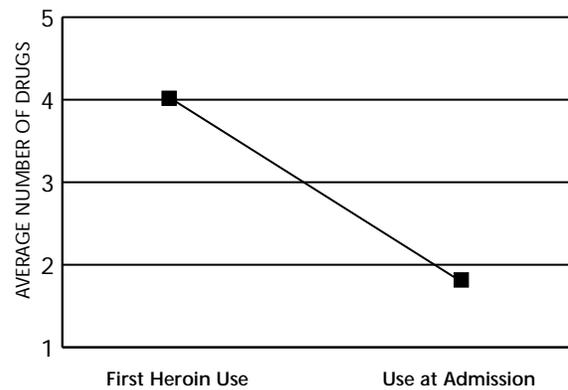


Figure 7: Average Number of Drugs Used



Dependence, however, is not synonymous with addiction. While heroin produces changes in the brain that are responsible for dependence and withdrawal syndromes, it is the compulsive and uncontrolled drug seeking and use that characterize addiction. Heroin addicts may become obsessed with obtaining and using heroin despite severe negative consequences to their physical, psychological and social well-being.

Many people with chronic pain who use opiates over an extended period are able to stop the use once their pain has been resolved – without experiencing the potentially devastating symptoms of addiction. Even abusive use of heroin may not lead to addiction. Research on returning Vietnam servicemen who had abused heroin while on tour in Vietnam found that most of these veterans did not continue to abuse heroin once they returned home<sup>[19]</sup>.

The differences between heroin dependency and heroin addiction suggest that heroin addiction is a complex disease, which has intertwining biological, psychological and social causes as well as serious biological, psychological, and social effects.

## Heroin Addiction: A Bio-Psycho-Social Disease

### Nature or Nurture

The causes of drug addiction are still unclear. Rather than finding one single determinant, scientists have identified a number of biological, psychological, and social/cultural preconditions as precursors of addiction.

A biological basis (nature) for heroin addiction is supported by research on heredity. A theory of biological predisposition<sup>[20]</sup> posits that vulnerability to opiate addiction is partly determined by the natural actions of the endogenous opioid system rather than solely due to chronic opiate use. Genetic susceptibility to opiate addiction is supported by a large body of research that strongly indicates vulnerability to drug abuse may be partially inherited. Other research on biologic family trees<sup>[21]</sup> indicates that the child inherits direct links to substance abuse from the parent, and also indirect links to antisocial personality disorder and drug abuse from parents with antisocial personality disorder.

Research conducted on animals suggests a compelling case for the importance of environmental factors (nurture) as determinants of future drug use. Laboratory studies show that limited access to alternative activities and rewards for those activities results in high levels of drug use. Although these studies cannot be ethically replicated with humans, Carroll<sup>[22]</sup> noted that “in human situations where nondrug activities and rewards are extremely limited, such as in war zones, prisons, homeless camps, and low-income, inner-city life, the rate of drug abuse is quite high.”

Especially for psychological and social factors, it often is difficult to determine if the condition preceded or followed initiation to heroin. Rather than specifically identify each factor as a “determinant” or “consequence,” this section aims to identify a range of biological, psychological, and social conditions that negatively impact the addicted person.

## Biological Issues

### Medical Complications of Use

Heroin acts on multiple systems of the body and produces negative health consequences on many aspects of biological functioning. Opiate use itself can be lethal through overdose. From 1991 to 1995, in major cities throughout the United States, the annual number of opiate-related emergency room visits increased from 36,000 to 76,000, while the annual number of opiate-related deaths almost doubled from 2,300 to 4,000<sup>[21]</sup>. These deaths include accidental

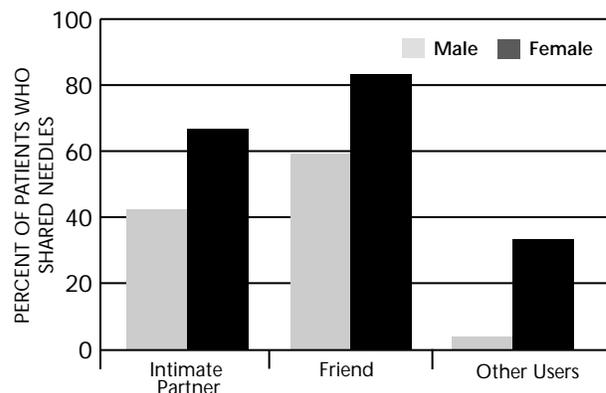
overdose, drug-related accidents and many illnesses that are directly related to chronic drug use.

Withdrawal symptoms include restlessness, muscle and bone pain, insomnia, diarrhea, vomiting, cold flashes, and excessive leg movements<sup>[6]</sup>. Although the main withdrawal symptoms subside within a week, some people experience symptoms for a number of months<sup>[6]</sup>. Some scientists contend that there is a protracted period of withdrawal from opiates<sup>[4]</sup>. They note that people addicted to opiates often have high rates of relapse and recurrent cravings for opiates in addition to other physical symptoms up to nine months following detoxification.

A major route of transmission of HIV and hepatitis B and C is through sharing needles used in intravenous drug use. In 1991, the Center for Disease Control<sup>[4]</sup> reported that over 32% of all AIDS cases were associated with illicit drug use. Forty-four percent of the Caron Foundation patients surveyed for heroin dependence<sup>[12]</sup> acknowledged they had shared needles. Both male and female patients were more likely to share with friends than with intimate partners or other users. However, as shown in **Figure 8**, female patients who reported sharing needles were more likely to share with intimate partners, friends or other users than were male patients who shared needles.

Other medical problems that are directly and indirectly caused by chronic heroin use are tuberculosis, liver and kidney disease, pneumonia, bacterial infections of blood vessels and heart valves, abscesses and

Figure 8: People with Whom Patients Shared Needles



soft-tissue infections, scarred and collapsed veins, and irritation of the nasal and pulmonary mucosa<sup>[4,6,21]</sup>.

### **Gender Concerns**

Pregnancy may entail especially severe medical consequences for female heroin users. Heroin can cause miscarriage and premature delivery, and children born to addicted mothers are at risk of dying from sudden infant death syndrome<sup>[4,6]</sup>. For these reasons, pregnant women addicted to heroin are advised not to be detoxified from opiates, but to be treated with methadone throughout the pregnancy. Fortunately, there are few effects of in utero exposure to methadone<sup>[6]</sup>.

### **Psychological Issues**

A large number of heroin-addicted individuals also suffer from a co-existing psychiatric disorder. Depression, antisocial personality disorder, post traumatic stress disorder, and anxiety disorders appear to be the most frequently reported psychiatric disorders<sup>[4,18,23]</sup>. A recent study of individuals treated at a methadone maintenance clinic<sup>[23]</sup> found that all the patients surveyed suffered from at least one psychiatric disorder in addition to heroin addiction. The most common diagnoses were anxiety disorders, antisocial personality disorder, obsessive-compulsive disorder, depression and somatization.

Nunes and colleagues<sup>[24]</sup> estimate that 80% of the symptoms of anxiety and depression found in heroin-addicted people is due to chronic use or withdrawal. They also note that other medical conditions commonly experienced during heroin addiction cause symptoms similar to depression, such as fatigue and apathy. These symptoms should decrease with proper medical and addiction treatment. However, the remaining patients who suffer from an underlying psychiatric disorder will not be helped by medical or addiction treatment alone.

If these disorders are not treated, it is likely the addicted individual will experience increased severity of the psychiatric problems and a decreased ability to recover from the addiction.

### **Gender Concerns**

Psychiatric problems appear to have a greater prevalence among women than among men. Women who were surveyed in a methadone treatment

program<sup>[25]</sup> reported that they were more likely to use drugs to alleviate psychological distress than were male patients. They also reported higher occurrences, than did men, of depression and anxiety as well as psychiatric treatment for these problems.

### **Social Issues**

Social issues related to heroin use concern how the addicted person relates to his or her environment, including interpersonal and family relationships, employment, and legal problems.

### **Interpersonal Relationships**

Inability to maintain committed long-term relationships may be a symptom of larger relationship problems. At the Caron Foundation, we have found that relationship problems are prevalent among adults admitted to treatment for heroin addiction. When asked to identify their relationship status<sup>[12]</sup>, only 25% of heroin addicted patients attested to either being married (13.3%) or living with someone in a committed relationship (12%). Twenty percent had failed or failing marriages and almost 55% identified themselves as single.

### **Family**

Chronic drug use often has devastating effects on family life. Living with other people, especially family members, who are addicted to drugs and alcohol may negatively influence vulnerable family members into addiction. Addiction in the family household also may pull families apart as healthy family members become alienated from the addicted person.

When we surveyed adults in treatment for heroin addiction at the Caron Foundation<sup>[12]</sup>, we found that most patients were currently living with at least two other family members, although the total number of other family members in the household ranged from none to six. Most of the patients (almost 95%) did not live with friends. Patients who lived in households with other family members generally lived with family who did not abuse heroin (79%) or other drugs or alcohol (71%).

### **The Law**

Addicts often use illegal methods of obtaining drugs because heroin addiction can become a very expensive habit. Adult patients at the Caron

Foundation<sup>[12]</sup> reported spending an average of almost \$100.00 per day on heroin, ranging from no money spent to spending up to \$700.00 per day.

As seen in **Figure 9**, adult heroin dependent patients at the Caron Foundation<sup>[12]</sup> used a variety of legal and illegal means to obtain money for drugs. Illegal methods of drug dealing and theft were reported by over 75% of the patients. Nationally, more than 95% of opiate-dependent individuals are reported to have committed crimes during an 11-year period, ranging from homicides to crimes against property<sup>[21]</sup>.

**Socioeconomic Status**

As can be seen by **Figures 3 and 4**, both male and female heroin-addicted patients at the Caron Foundation have high levels of education and employment. This is not often the case with heroin-addicted populations. People who do not have high school degrees are more vulnerable to drug abuse (perhaps because they have fewer options) than people who are more highly educated. Chronic heroin addiction also tends to lower a person’s economic standing by reducing his or her ability to remain employed in full-time higher-paid occupations.

**Gender Concerns**

Although women and men face the same social issues of interpersonal relationships, family, and legal issues, gender factors may influence how these issues affect the person.

Drug use by a partner effects addicted persons, especially women. Women addicted to heroin in a

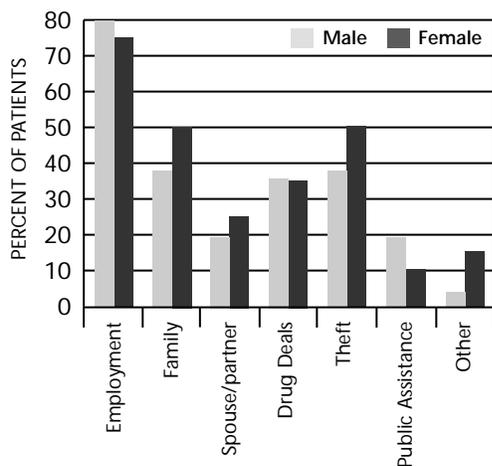
London clinic were more likely than were men to be involved in an intimate relationship and they were more likely than were men to have a partner who also used drugs<sup>[14]</sup>. Most female IV users in a British sample had been given their first injection by their intimate partner<sup>[26]</sup>.

As illustrated in **Figure 10**, at the Caron Foundation<sup>[12]</sup>, we found that female heroin-addicted patients were much more likely to have been introduced to heroin by their intimate partner than were men, although both sexes most often listed a same-sex friend as the person who introduced them to heroin.

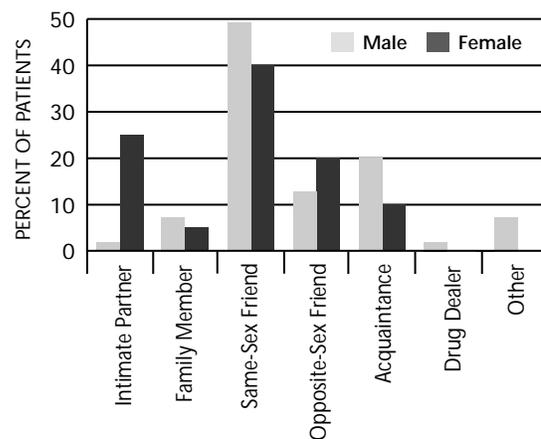
It also appears that family and spouse/partner are more important financiers of heroin use for female patients at Caron than they are for male patients<sup>[12]</sup> (see **Figure 9**). Seventy-five percent of the female patients reported receiving money from family and/or spouse or partner for heroin, while approximately 57% of male patients received money from family and/or spouse or partner for heroin.

Research comparing male and female heroin-addicted people has found that female heroin addicts are more likely than are male addicts to identify dysfunctional family dynamics as a motivator for drug use<sup>[27]</sup>. A recent survey of methadone maintenance patients found that more women than men, in the treatment program, reported having dysfunctional families-of-origin<sup>[25]</sup>. Women in treatment for heroin addiction also differ from male patients by having more dependent children living with them<sup>[25]</sup>.

**Figure 9: Sources of Money for Heroin**



**Figure 10: Introduction to Heroin**



## Treatment Issues

### Treating a Chronic Bio-Psycho-Social Disease

As we have seen, repeated use of heroin tends to produce long-term, if not permanent, changes in the brain, as well as profound negative effects on the addicted person's health, and psychological and social functioning. For many people, heroin addiction is accompanied by biological, psychological and social conditions that have made them especially vulnerable to the disease of addiction, which is appropriately considered a bio-psycho-social disease.

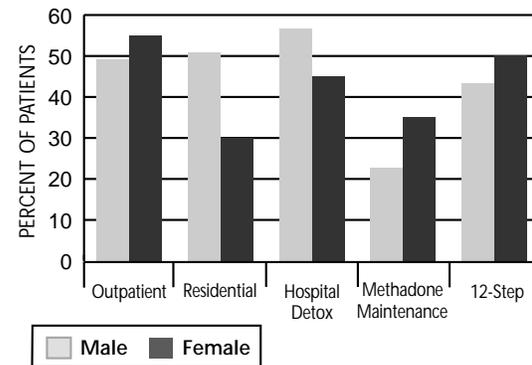
Similar to other chronic diseases such as diabetes, hypertension, and asthma, effective treatment of heroin addiction is a life-long process of managing the disease<sup>[28]</sup>, rather than curing it. Typically, heroin addiction treatment requires multiple treatment episodes to address relapse issues. Effective treatment also must address all areas of the patient's biological, psychological, and social functioning.

The first principle of effective drug addiction treatment identified by the National Institute on Drug Abuse is that "no single treatment is appropriate for all individuals"<sup>[28]</sup>. This principle strongly applies to treatments for heroin addiction. A number of treatment methods currently provide effective treatment for heroin addiction. However, the most effective treatment for one person may not be the best treatment for another person.

This report has identified a number of issues that impact men and women differently, and it is not surprising that men and women would have somewhat different treatment needs. Likewise, treatment for heroin addiction may differ for different cultural groups, depending on their needs and strengths, as well as for different age groups. For example, we would not expect adolescents with their special developmental needs to receive the same treatment that is given to older adults.

A major debate in heroin treatment is the decision to use either "drug-free" treatment, such as addiction counseling or other psychotherapies, or a long-term medication therapy, such as methadone. This report will not declare which of these treatment methods is the "best" or the most effective treatment. Instead, we will explore the benefits and disadvantages of each type of treatment.

Figure 11: Types of Prior Treatment



### Predictors of Abstinence and Relapse

As we mentioned earlier in this report, heroin is a chronic disease characterized by multiple relapses. Over 80% of heroin-addicted patients surveyed at the Caron Foundation<sup>[12]</sup> attested to having attended at least one treatment program prior to their current treatment episode. Other treatments they had attended include hospital detoxification program, outpatient treatment, residential treatment, 12-step program (not considered a "treatment" but a structured self-support program) and methadone maintenance program. See **Figure 11** for percentages of previous treatments that patients had attended.

Repeated treatment episodes, however, should not be viewed as treatment failure. Relapse followed by treatment actually is predictive of future recovery. The cumulative effect of multiple treatment episodes has been positively related to longer retention in treatment and to reduced drug use<sup>[29]</sup>.

A large number and variety of bio-psycho-social factors related to recovery, have been identified. Generally, the more problems a person has functioning in his or her overall life, the more difficult it will be for that person to achieve and maintain abstinence from a chemical addiction. For example, family dysfunction and association with deviant peers are strong predictors of drug use and relapse.

Heroin-addicted patients who are able to improve their family relationships and decrease friendships with deviant peers are more likely to decrease their own drug use and engage in much fewer illegal activities than patients whose family and peer relationships continue to deteriorate<sup>[30]</sup>. Richard Snyderman, a therapist with

Caron Foundation, noticed that the “emotional isolation” of many heroin-addicted patients may be a barrier to developing positive peer relationships and must be addressed in treatment.<sup>[31]</sup>

Empirical evidence<sup>[32]</sup> as well as clinical observation indicates that internal dynamic characteristics of the addicted person (such as attitudes toward other drug use and motivation for treatment) may be as important as background or socioeconomic factors in predicting abstinence and relapse.

### **Commitment to Recovery**

In order to benefit from treatment, patients must remain in treatment. Short treatment stays, due to a lack of patient motivation, increasingly are seen as predictors of relapse<sup>[32]</sup>. Likewise, a psychological commitment to recovery and complete abstinence appears to be an important predictor of treatment success.

For example, patients enrolled in a methadone maintenance program were more likely to be successful in maintaining abstinence from heroin, if their treatment goal was to “never use again”, rather than a less stringent goal<sup>[33]</sup>. When abstinent and relapsed patients enrolled in a therapeutic community were compared, the patients most likely to relapse justified and made excuses for their heroin use or craving for heroin in more situations than did the abstainers.

Alcohol, heroin, cocaine and crack-cocaine addicts in a long-term residential therapeutic community were assessed for their motivation and readiness for treatment<sup>[32]</sup>. The heroin addicts had the lowest retention rates for all of the groups and motivation and readiness for treatment proved to be the best predictor of treatment retention for the heroin addicted group.

To increase motivation for recovery from heroin addiction an addict needs to confront his or her basic denial systems. Snyderman<sup>[31]</sup> reported that many of the patients whom he treats appear to believe that “no one can tell” if they are using heroin. Even though his patients usually attend treatment sessions regularly, some seem to be fooling themselves into believing that they are controlling their heroin use and do not need the goal of total abstinence. Snyderman values the assistance of external leverage (such as from a proba-

tion officer or employer) to break down the patients’ denial and increase their engagement in treatment.

### **Multi-Drug Use**

A commitment to recovery appears to entail a commitment to abstain from all drugs and alcohol. Many people addicted to heroin are multi-drug users. A growing body of evidence demonstrates that continued use of heroin or other drugs while in treatment for heroin addiction complicates treatment and is a significant predictor of relapse. In addition to complicating detoxification and treatment, multi-drug users also are more likely to have more severe social problems and to engage in other risky behaviors, such as drug dealing and needle sharing, than are heroin addicts who do not abuse other drugs<sup>[17]</sup>. Use of other illicit substances while in treatment for heroin addiction also constantly exposes the patient to sources who distribute and promote the use of heroin<sup>[34]</sup>.

Magura and colleagues<sup>[35]</sup> found that patients enrolled in a methadone treatment program had much shorter treatment lengths if they continued to use heroin and/or cocaine. In this study continued cocaine use was a stronger predictor of early treatment termination than was heroin. Also, continued nicotine use while in treatment for another drug addiction may be a predictor of relapse to use of the other drug. Recent research on the use of nicotine among heroin and cocaine addicts strongly indicates that cravings for nicotine are related to increased cravings for heroin and cocaine and may be triggers for relapse<sup>[36]</sup>.

Marijuana use also has been shown to have a negative effect on heroin treatment. Like heroin, marijuana increases the action of the neurochemical, dopamine, in the brain. Since the two drugs have similar actions, it is thought that marijuana use may be another trigger for heroin relapse<sup>[33]</sup>. Patients in a number of types of treatment programs (drug-free and medication maintenance) have shown higher rates of relapse if they have used marijuana during treatment<sup>[17,33,34]</sup>.

Research such as these studies and clinical observations by clinicians have led a number of treatment providers, both in drug-free and medication maintenance programs, to support the goal of total abstinence

from alcohol, nicotine, and other non-prescribed substances for patients in treatment for heroin addiction. Treatment providers have found that use of drugs and alcohol during treatment decreases the ability of patients to learn positive coping skills for cravings and other life stressors<sup>[34]</sup>.

### **Treatment Begins with Detoxification**

Detoxification from heroin is the process of decreasing and eliminating heroin from the body. As we have seen, due to changes in brain functioning produced by chronic heroin use, even a reduction in heroin use may precipitate withdrawal symptoms. The goals of heroin detoxification are to minimize the discomfort of withdrawal symptoms and to enhance the patient's motivation and ability to remain engaged in treatment<sup>[6]</sup>. Use of medications has proven to be effective in reaching these goals.

It is important to remember that detoxification is only a beginning to treatment. Detoxification programs that are not followed by long-term drug-free or medication maintenance programs are rarely successful. Some heroin-addicted patients deliberately enter detoxification programs in order to lower their tolerance threshold, and thereby, increase their experience of a euphoric high from heroin<sup>[31]</sup>. Detoxification programs that are combined with a strong treatment component may increase these patients motivation for recovery.

### **Why Use Medication for Detoxification**

Although withdrawal from heroin can be extremely uncomfortable, unlike alcohol withdrawal, it is generally not a life-threatening condition. However, a "cold-turkey" withdrawal, without medication to relieve the short-term symptoms, may precipitate a rapid return to heroin use because the addicted person does not feel as though he or she can tolerate the symptoms.

### **Detoxification Medications**

A variety of medications are used to treat heroin withdrawal symptoms during detoxification. Some of the medications, such as methadone, provide a direct substitution for heroin without the pleasurable feelings (the "rush") induced by heroin, these are called agonists. The dose of this substitution for heroin is

gradually reduced until withdrawal symptoms subside<sup>[4]</sup>. However, short-term detoxification with methadone has not proven to be successful for long-term recovery<sup>[37]</sup>.

Clonidine, a non-opioid medication, reduces the release of norepinephrine, a brain chemical that effects the sympathetic nervous system, and suppresses some withdrawal symptoms. However, used alone it is not very effective for some of the troubling psychological symptoms of withdrawal<sup>[4]</sup>. It appears to be more effective when combined with naltrexone. Naltrexone, an antagonist, blocks the ability of heroin to attach to brain receptor sites and produce a rush<sup>[4,38]</sup> and induces withdrawal symptoms that may be managed with other medications, such as clonidine<sup>[4]</sup>.

Recently, opiate antagonists are being combined with anesthetics and sedatives as a rapid detoxification method. This method is highly controversial and still experimental<sup>[4]</sup>. Patients are sedated in order to avoid experiencing withdrawal symptoms and are administered a combination of naltrexone and naloxone to induce withdrawal. Following detoxification, naltrexone usually is prescribed in order to decrease subsequent euphoric effects of heroin. Serious side effects of respiratory depression caused by the sedation may be life threatening if the patient does not receive adequate medical monitoring<sup>[39]</sup>. A follow-up study<sup>[40]</sup> found that 43% of patients who could be contacted had stopped taking the prescribed naltrexone and had returned to daily heroin use.

Buprenorphine, is another medication that shows promise for use in heroin withdrawal. It is undergoing the FDA regulatory process and is described in the section on "Medication Maintenance Therapies" in this report.

## ***Recovery Options***

### **12-Step Programs**

Twelve-step self-help programs, such as Narcotics Anonymous (NA), are not treatment programs. They do not define themselves as "treatment" nor do they employ the professional counselors or therapists who are found in treatment programs. However, 12-step programs, probably, are the most commonly used interventions for substance abuse<sup>[38]</sup>. Alcoholics

Anonymous groups can be found in most American cities and in over 150 countries. The 12-step model of addiction, also known as the “disease model”, has been extremely influential in the development of drug-free treatment programs such as addiction counseling and therapeutic communities.

NA is a 12-step program that was created in 1947 at the U.S. Public Health Service Hospital in Lexington, Virginia, to address the needs of opiate-addicted patients<sup>[38]</sup>. Like other 12-step programs, NA considers heroin addiction to be a disease, with major symptoms including loss of control over using any drug or alcohol and spiritual emptiness. The remedy for this biologically based disease is seen to be complete abstinence from all drugs and alcohol as well as the experience of a spiritual awakening by turning control over to a higher power.

NA and other 12-step program members attend regular peer-led group meetings. New members are strongly encouraged to attend 90 meetings in 90 days, which provides a strong immersion in a recovering community during the most vulnerable time of early recovery<sup>[38]</sup>. Members also are encouraged to seek a sponsor, who is a member of NA and whose recovery and understanding of the 12-steps are strong enough to allow him or her to guide the new member toward recovery.

Research on the effectiveness of 12-step programs is difficult to conduct because the groups are voluntary and emphasize anonymity. It appears that the programs are beneficial to people who become highly involved in them<sup>[38]</sup>.

## **Drug-Free Treatments**

Drug-free treatment programs differ from medication maintenance in many ways. One important difference is that drug-free treatments are designed to address a wide variety of chemical addictions, while medication therapy is specific to a particular addiction. Thus, two patients addicted to two different drugs, such as marijuana and heroin, could both benefit from participating in the same drug-free program. However, these same two patients would not benefit from participating in the same medication therapy, because the medication

appropriate for treating heroin addiction is not appropriate for treating marijuana addiction.

## **28-Day Treatment Model**

Traditional residential drug-free addiction treatment is based on the philosophy of the 12-step programs. It firmly adheres to the understanding that addiction is a physical disease – not the side-effect of another psychiatric disorder, not a learned behavior, and not a moral failing. Historically, traditional residential addiction treatment is known as the “Minnesota Model” or “28-day model” because it began at a small state hospital in Willmar, Minnesota and utilized a 28-day length of treatment <sup>[41]</sup>.

Drug-free addiction treatment programs began with the philosophy that addiction is a primary disease and they focused only on treating the addiction. The three main models of intervention employed by 28-day model addiction treatment programs are education to increase knowledge about the disease and skills needed to recover; therapy to address emotional conflicts and motivation; and fellowship to build supportive peer communities<sup>[41]</sup>. Following an assessment of the patient’s needs and detoxification from drugs of abuse, traditional addiction counseling educates patients about their disease and the 12-step approach to recovery.

Programs mainly utilize group therapy and lectures, although some also incorporate family and individual therapy as well as other therapeutic approaches, such as expressive therapies. Group addiction therapy generally is facilitated by certified addiction counselors who guide and direct the group. However, group participation is crucial for success. It is the power of the group members as a whole that is thought to effect changes in its members<sup>[38]</sup>. Unlike 12-step meetings, in addiction group therapy members receive feedback from the group leader as well as from other members. Historically, addiction group therapy has used confrontational techniques, but in many treatment programs this approach is changing to a more supportive and empathic approach.

Traditional addiction treatment programs and approaches to treatment are widely used in the addiction treatment field, but have not been exten-

sively studied or evaluated<sup>[41]</sup>. Outcome evaluation studies for some programs show one-year post-treatment abstinence rates ranging from 53% to 89% for patients with a wide variety of chemical addictions<sup>[41]</sup>.

### **Relapse Prevention Therapy**

A number of cognitive-behavioral therapies were developed in the 1970's and 1980's to address the dysfunctional thinking and coping patterns of persons with drug and alcohol addictions. One of the most utilized approaches in the drug and alcohol treatment field, relapse prevention therapy, was developed by Alan Marlatt<sup>[38]</sup>. Relapse prevention therapy focuses on increasing the skills of people in early recovery to maintain abstinence. It is based on the understanding that addiction is a chronic disease with almost inevitable relapses. The therapy proactively teaches patients how to identify triggers for relapse, how to develop alternative coping strategies for cravings and how to quickly learn from a relapse to drug or alcohol use in order to prevent a more severe relapse.

Relapse prevention and other cognitive-behavioral therapies differ from other drug-free addiction treatments in that they are based on the theory that addiction is a learned behavior, not a disease. Most cognitive-behavior theorists and practitioners consider drug addiction to be a set of dysfunctional behaviors that are due to irrational beliefs and negative thoughts. The goal of treatment is to change the cognitive patterns by teaching more productive strategies for coping with stress. The multiple healthcare, psychological, social and spiritual needs of the patients are not addressed in treatment unless they had been identified

as specific triggers for relapse.

Although the philosophy and overall treatment goals of relapse-prevention therapy are dissimilar from traditional drug-free addiction treatment, it has gained a well-deserved respect and use in the treatment field. The effectiveness of relapse-prevention programs has been demonstrated in a number of evaluation studies<sup>[38]</sup>.

### **Therapeutic Communities**

The traditional therapeutic community (TC) is a long-term residential program with planned treatment stays of 15 to 24 months<sup>[32]</sup>. Therapeutic communities developed in the 1960's, a time of increased drug use and distrust of professionals. Based on their early distrust of professional mental health providers, who often looked at addiction as secondary to other psychiatric problems, Charles Dederich and a group of recovering friends started a self-help community for heroin addicts<sup>[38]</sup>. TC's are based on the concept that addiction affects the entire person and the goal of the therapeutic community is to rebuild the person through long-term residential drug-free treatment<sup>[38]</sup>.

The primary therapist for the TC is the community itself, as peers and trained staff work together to induce change in the context of a 24-hour a day, 7-days a week program<sup>[32]</sup>. Most TC's, however, do employ trained staff who serve as clinicians and who provide administrative, medical, educational and other essential support services. Many staff are recovering from a chemical addiction and have been through TC programs<sup>[38]</sup>.

# The Caron Foundation Experience

## A Learning Experience

Similar to the experience of many treatment centers, the Caron Foundation initially found itself unprepared to handle the new heroin epidemic as addicts turned to us for treatment in the mid 1990's. Careful monitoring of patient compliance with treatment and lengths of treatment stay data revealed an increase in the number of heroin-addicted patients who had "unusual discharges," meaning that they left treatment against medical advice or because they were not compliant with the treatment regimen.

In order to rectify this situation and to improve our ability help these patients, we initiated a number of research studies to learn more about the needs of this population. These research projects included reviews of the clinical charts of heroin-addicted patients<sup>[11,42]</sup>, staff assessments of physical and psychological functioning of the patients<sup>[42]</sup>, patient questionnaires concerning their history of addiction and current heroin and other drug use patterns<sup>[12]</sup> and quality improvement reviews of discharge dispositions of heroin addicted patients<sup>[43]</sup>. Much of the data collected by these studies has been presented throughout this report.

A complex profile of the heroin-addicted patient emerged from these studies. We found that the patients admitted to the Caron Foundation often suffered from severe physical and psychological discomfort during detoxification. They also presented to treatment with chronic life-threatening diseases, such as hepatitis and HIV infection, as well as acute illnesses due to risky intravenous drug use and sexual practices. In addition, the patients often showed underlying psychological problems and social difficulties with interpersonal relationships. They also presented with histories of multi-drug use and chronic relapse problems. Finally, we noticed both age and gender differences among the heroin-addicted patients.

Based on the data we gathered on our patient population as well as the understanding that heroin addiction is a multi-faceted disease that affects bio-psycho-social areas of functioning, we reviewed and revised treatment protocols to improve functioning in all of these areas.

## Program Development

Unlike the original 28-day program model that focused only on addiction, the Caron Foundation has broadened its scope of treatment to address the patients' other needs in order to reduce relapse. We employ physicians, nurses and other healthcare professionals, psychiatrists, psychologists and trained psychotherapists, and recreational and nutrition therapists, as well as certified addiction counselors to address the physical, psychological and social needs of patients. A full-time chaplain and assistant focus on patients' spiritual needs. Issues that cannot be addressed in treatment are identified and referred to other community resources to be addressed during or following treatment.

An important issue that needed attention was the physical and psychological discomfort experienced by the heroin addicts while they were in the detoxification program. A review of clinical charts of opiate-addicted patients at the Caron Foundation in 1997<sup>[42]</sup>, found that the patients who left abruptly, against medical advice, had more frequent and more severe withdrawal symptoms than the patients who remained in treatment. The patients who remained in treatment had no symptoms in the severe range and mainly experienced physical, rather than psychological or behavioral, problems.

These findings led our medical team to revise the heroin detoxification protocol. A review of the clinical charts of heroin-addicted patients who followed the revised detoxification protocol showed a decrease in the rate of patients who left treatment against medical

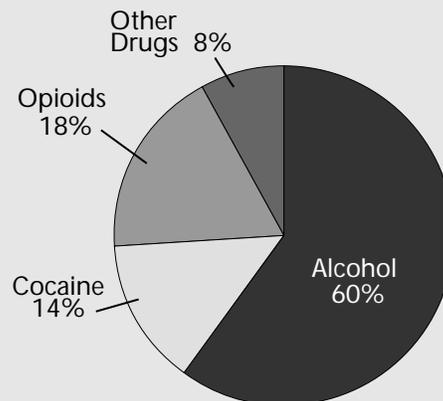
advice. It also revealed an appreciable decrease in the number and severity of withdrawal symptoms that these patients experienced<sup>[42]</sup>. Our experience illustrates the need to address the pain and discomfort of withdrawal, in order to increase the likelihood that the patient will remain in treatment and benefit from the rehabilitation part of the program.

In addition to addressing the detoxification needs of patients, it is also important to thoroughly address the other medical issues presented by heroin addicts. As our medical staff grew to include a fulltime medical director and chief of staff, we increased our ability to conduct thorough medical histories and evaluations and to treat the acute medical problems, such as infections due to intravenous drug use. We also trained medical staff to assess for HIV risk and to provide voluntary and confidential HIV testing and counseling. In addition, we added to the patient treatment program an educational component concerning the risks of intravenous drug use and HIV transmission.

Many heroin-addicted patients have histories and current practices of multi-drug use. The Caron Foundation's philosophy is that addiction encompasses all drug and alcohol use, regardless of the specific drugs of choice of individual addicts. Our treatment goal is total abstinence from all drugs and alcohol. Unlike medication treatments that focus only on heroin addiction, our drug-free philosophy has proven to be an effective treatment approach for multi-drug users as well as for patients who are addicted to a wide variety of drugs. From July 1999 through June 2000, the Caron Foundation adult treatment programs admitted patients who used over 18 primary drugs<sup>[13]</sup>. The most commonly abused drugs were alcohol, opioids (heroin and other opioids), and cocaine. **Figure 12** illustrates the percentages of patients admitted for a primary addiction to each of these drugs.

Many heroin addicts suffer from chronic relapse problems. The Caron Foundation is a leader in the development of relapse prevention programs. Our Intermediate Treatment Program is specifically designed to treat patients who have had repeated relapse to drug use. Much of the program is based on teaching basic relapse prevention skills, which are

Figure 12: Patients in Treatment by Primary Drug

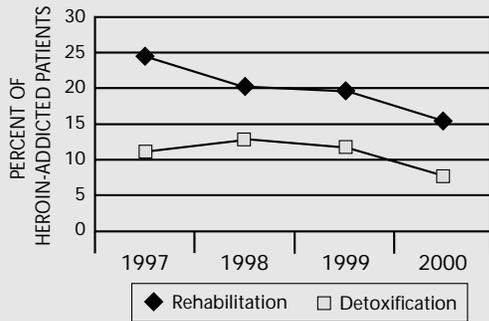


enhanced with education on the disease model of addiction, attention to other psychological, social and medical problems, and a strong spirituality component.

The Caron Foundation also strengthened its other treatment programs to address the needs of its heroin-addicted patients. Research has shown that longer treatment stays are positively associated with recovery from chemical addictions. The Caron Foundation's extended care programs are similar to therapeutic communities in that both are based on the understanding that addiction affects the entire person and that it takes a long time to rebuild the person. Unlike a traditional TC, our extended care programs generally have shorter lengths of stay (three months to one- year), provide more professional counseling support, and rely more on professional guidance.

A major issue facing our heroin-addicted patients is their difficulties with family and interpersonal relationships. We have found group therapy, which is the basic addiction treatment approach utilized by the Caron Foundation, to be an excellent tool for identifying interpersonal deficits and developing more productive ways of relating to others. Unlike individual therapy programs it also introduces patients to a community of people motivated to recover. Caron Foundation treatment programs also foster continued motivation for recovery following treatment by exposing patients to 12-step programs, such as Narcotics Anonymous, and encouraging patients to utilize these programs following discharge.

**Figure 13: Unusual Discharge Rates for Caron Treatment Programs**

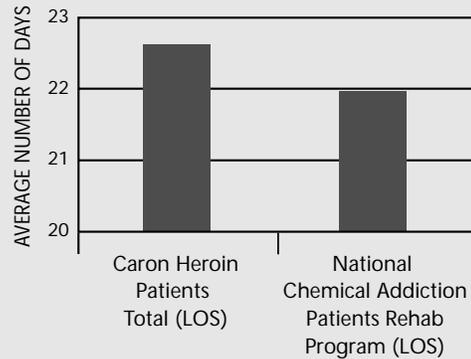


Female heroin-addicted patients appear especially vulnerable to drug using behaviors by their intimate partners. As we have seen, female patients are more likely than male patients to have been exposed to heroin by an intimate partner. The Women’s Treatment Program at the Caron Foundation is designed to enable women to explore their relationship issues and to learn effective gender-specific techniques to support their recovery. Likewise, adolescents, who are vulnerable to peer pressures to use drugs and engage in other risky behaviors, also have separate and age-appropriate treatment at the Caron Foundation Adolescent Treatment Center to address these issues. In addition, the families of patients are encouraged to participate in family education and self-development programs to learn how to relate more effectively to the addict in order not to unwittingly encourage his or her drug use.

**Where We Stand Today**

The Caron Foundation has come a long way since our initial exposure to the most recent wave of heroin addicted patients. As you can see from **Figures 13, 14, and 15**, the Caron Foundation has increased our ability to retain and treat heroin-addicted patients effectively. Patients who were discharged due to non-compliance or against medical advice (known as “unusual” discharges) have dramatically decreased (see **Figure 13**). Improvements in detoxification protocol decreased unusual discharges from over 13% to our most recent low of under 8%. More dramatically, unusual discharge rates have decreased for the rehabilitation programs from almost 25% in 1997 to 15% in 2000<sup>[43]</sup>.

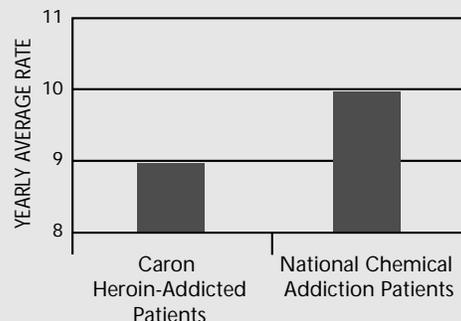
**Figure 14: Length of Treatment Stay (LOS) Comparison**



Effective treatment of heroin addiction does not have to lag behind treatment of other chemical addictions. Our total length of treatment stay for adult heroin-addicted patients is over 22 days<sup>[13]</sup>. This length of stay is comparable to the national average of 22 days for adult residential treatment stays for any chemical addiction<sup>[44]</sup> (see **Figure 14**). From July 1, 1999 through June 30, 2000, 123 heroin-addicted patients were admitted to Caron’s medical detoxification program<sup>[13]</sup>. Only 11 patients (9%) left the detoxification program against medical advice. The national average for patients with any chemical addiction who leave an inpatient detoxification program against medical advice is 10%<sup>[44]</sup> (see **Figure 15**).

Through research and program development we have been able to increase the lengths of stay of our heroin-addicted patients and have been able to decrease early discharges due to patient dissatisfaction and inability to cope with the program.

**Figure 15: A.M.A. Discharge Rate Comparison**



## Medication Maintenance Treatments

Some people addicted to heroin are able to achieve recovery through drug-free treatment, while others repeatedly relapse. For these people, long-term maintenance treatment with medication that relieves the major symptoms of heroin addiction may allow them to pursue “normal” lives and to become productive citizens. Medication maintenance therapies are most effective when they are combined with addiction counseling to address relapse issues, psychotherapy to address emotional problems, and other professional services to address medical and social issues.

### Methadone

Methadone is the oldest medication treatment for heroin addiction. It has been used for over 30 years. Approximately 100,000 people addicted to heroin receive methadone maintenance treatment in over 750 clinics throughout the United States<sup>[3]</sup>.

Like heroin, methadone is an opioid and can cause addiction, which is why it is a highly regulated medication. Unlike heroin, which works for about four to six hours, methadone’s effects last for about 24 hours. This means that a person needs to take methadone once a day instead of seeking heroin throughout the day. Taken correctly, methadone will block the euphoric effects of heroin without producing a “rush” of its own. Methadone also is medically safe and has relatively few side effects, even when used continuously for over 10 years<sup>[6]</sup>. Research indicates that methadone is more effective when prescribed at higher levels than originally were used for maintenance<sup>[37,45]</sup>.

Because methadone is dispensed in daily doses at regulated specialized clinics, the providers are able to address the patient’s other bio-psycho-social needs through medical treatment and counseling. Appropriately used, methadone therapy has been shown to decrease mortality and morbidity of illicit drug use, decrease the symptoms and spread of HIV/AIDS, reduce criminal activity associated with drug use, decrease health care costs, and decrease joblessness<sup>[21,37,45]</sup>.

Methadone maintenance treatment is problematic for many people. Approximately half of the people

admitted to methadone maintenance programs leave within the first 12 months of treatment and some of the patients who remain in treatment continue to abuse heroin and other drugs<sup>[45]</sup>. Since its effects last for only 24 hours, patients must receive doses of methadone on a daily basis. For most patients, this means daily trips to a government-approved clinic – which can severely hamper the ability of the patient to work, care for children, attend school or engage in other normal activities<sup>[37]</sup>.

In addition to unintentionally promoting illegal sales of methadone, clinics often become unintended centers for other illegal drug sales. The resulting increase in criminal activities around the clinics increases the stigma of methadone clinics and reduces the willingness of neighborhoods to allow them to operate. A major barrier to methadone treatment is the scarcity of clinics in rural and suburban areas<sup>[21]</sup>. Finally, some patients discontinue methadone treatment because they cannot tolerate side effects such as constipation and decreased sexual interest.

### LAAM

LAAM (levo-alpha-acetyl-methadol) is a relative newcomer as a medication treatment for heroin addiction. It was approved by the Food and Drug Administration as an opiate maintenance therapy in 1993, but was not approved for either short- or long-term opiate detoxification<sup>[46]</sup>. LAAM had been tested for 20 years prior to approval, making it the most researched medication for opioid addiction<sup>[37]</sup>.

Like methadone, LAAM is an opioid and can become addictive with uncontrolled use. LAAM differs from methadone in that it blocks withdrawal effects for as long as 72 hours which eliminates the need for daily clinic visits. LAAM generally is administered three times a week<sup>[37]</sup>.

Clinical research studies find LAAM comparable to methadone in terms of reduction of heroin use, treatment retention, and patient acceptance. Patients who seem to respond best to LAAM are those who benefit the most from less frequent clinic visits. Patients who need higher daily levels of structure and support seem to benefit from LAAM the least. LAAM also may be

helpful to people who have difficulty making daily trips to a clinic, people who have not complied with the regimen of methadone treatment, people who have been dissatisfied with methadone, or people who avoid methadone treatment because of its stigma<sup>[37]</sup>.

Unlike methadone, LAAM has not been approved for use during pregnancy or nursing. LAAM also is not approved for people under the age of 18<sup>[37]</sup>. The longer-acting qualities of LAAM complicate its initial administration. Patients may not understand that LAAM's effect will peak at a later time than heroin or methadone. Use of other psychoactive drugs and alcohol could result in a fatal overdose<sup>[37]</sup>. Another disadvantage with LAAM is that take-home doses currently are not permitted. Patients are tied to three weekly clinic visits and must transfer to methadone if they plan to be away from the area. Unplanned interruptions could lead to withdrawal symptoms.

### **Naltrexone**

Naltrexone is an opiate antagonist that blocks the actions of heroin in the brain and stops the patient from feeling the pleasurable aspects of heroin. It is not an opioid and is available by prescription from a physician's office. Home administration, instead of visits to a methadone/LAAM clinic, significantly reduces the stigma of the medication and increases its ease of use.

Naltrexone appears to be most effective in treating highly motivated individuals such as heroin-addicted physicians, attorneys, and probationers<sup>[6,45]</sup>. However, naltrexone's antagonistic action does not provide any relief from cravings for heroin. This may be a reason for its low retention rate which has lowered its effectiveness as a treatment option<sup>[45]</sup>.

An advantage of naltrexone is that it may be prescribed in the privacy of a health provider's office and taken in the privacy of one's home, eliminating the need to make frequent visits to stigmatized clinics. However, this advantage also may work against the effectiveness of the medication if health care providers do not address the other issues of addiction.

### **Buprenorphine**

Buprenorphine currently is under investigation by the National Institute on Drug Abuse as a medication

for opiate detoxification as well as for long-term maintenance therapy. Buprenorphine is a partial agonist-antagonist opioid. It acts like other opioid agonists by binding to opiate receptor sites in the brain and it acts like other opioid antagonists by blocking the euphoric feelings produced by opioids. This dual action gives buprenorphine a "ceiling effect" – increasing the dose lengthens the duration of its action without increasing the intensity of its effect<sup>[37]</sup>. The ceiling effect significantly decreases the chances of overdose and reduces the severity of withdrawal symptoms<sup>[37]</sup>. The combination of buprenorphine with naloxone (a pure antagonist) makes the medication even less desirable for illegal abuse because the naloxone produces immediate and severe withdrawal symptoms in people who currently are using heroin or other opiates<sup>[47]</sup>.

Buprenorphine therapy has been found to be effective in reducing heroin use and decreasing negative addiction-related health and social problems in addicts<sup>[37,48]</sup>. It has few side effects and has been well accepted by heroin-addicted patients<sup>[37]</sup>. Its mild withdrawal symptoms make it a good medication for initial detoxification. Also, patients on buprenorphine maintenance therapy may be able to take it every other day or as infrequently as three days a week<sup>[37]</sup>.

The Drug Addiction Treatment Act passed by the 106th Congress allows buprenorphine to be dispensed by primary care providers in their offices as a treatment for heroin and other opiate addiction<sup>[49]</sup>. This represents a major shift in the administration of pharmacological maintenance therapy – the use of the medications methadone and LAAM are restricted to specialized clinics.

Addiction specialists have expressed concern that medication maintenance therapy alone is insufficient to treat a complex bio-psycho-social disease like heroin addiction. Organizations such as the College on Problems on Drug Dependence, the Academy of Addiction Psychiatry, the American Society of Addiction Medicine, and the American Psychological Association have lobbied Congress to include the need for addiction counseling and psychosocial services with treatment<sup>[49]</sup>. An advantage of the specialized

methadone clinics is that they are mandated to address a wide array of patient needs. It is hoped that buprenorphine treatment providers also will identify the patient's other healthcare, psychological, and social needs and will diligently refer the patient to other providers who can address these needs. If buprenorphine therapy is isolated from other psychosocial treatments, its effectiveness may be seriously compromised.

## ***Treatment Works!***

### **Improvements Associated with Treatment**

Drug treatment provides a relatively inexpensive means of reducing drug use. The total costs of reducing illicit drug use in the United States take into account attempts to reduce drug availability by attacking drug production abroad and stopping its entry into the country, reducing the spread of drugs through domestic law enforcement, and by providing treatment to drug addicts. Estimates on the cost of these methods strongly indicate that drug treatment is the least expensive way to reduce drug use<sup>[38]</sup>. For the addicted person, his or her family, and society, the costs of not providing treatment are estimated to be approximately \$20 billion per year<sup>[21]</sup>.

In addition to providing a relatively inexpensive means of reducing drug use, drug treatment has also been shown to be highly effective in decreasing many of the negative bio-psycho-social effects of addiction. Numerous evaluation outcome studies give empirical evidence that heroin addiction treatments are effective in reducing heroin use<sup>[25,33,48]</sup> and other drug and alcohol use<sup>[25,30,33,48]</sup>. Heroin treatment also reduces HIV risks such as needle-sharing and unsafe sex practices<sup>[25,30]</sup>. Heroin addicted persons in treatment show a decrease in psychological problems<sup>[25,50]</sup>. Other social benefits of heroin treatment include reductions in illegal activities, less association with deviant peers, improvements in family relationships, and gains in productive employment<sup>[25,30]</sup>.

The Drug Abuse Treatment Outcome Study (DATOS)<sup>[51]</sup> is a major outcome evaluation project sponsored by the federal government. Over 10,000 heroin- and cocaine-addicted patients were assessed for

a wide range of bio-psycho-social issues when they were initially admitted for treatment. They were attending almost 100 programs that represented outpatient methadone maintenance, short-term inpatient, long-term residential, and drug-free outpatient programs spread throughout 11 American cities. One year after completing treatment, nearly 3,000 of these persons were contacted and assessed for changes in overall functioning.

Results of the DATOS follow-up found significant reductions in all types of drug use, including heroin. There also were reductions in criminal activity, risky sexual behavior, and suicidal thoughts and attempts. In general, the research found that patients who remained in long-term residential, outpatient drug-free treatments for more than three months used less drugs than did patients with fewer than three months of treatment. Other positive changes for patients who received more than three months of treatment prompted the investigators to conclude that "the longer the client remains in the program, the more likely behavior will improve or the client will be exposed to one or more comprehensive services that meet his or her needs" <sup>[51]</sup>.

### **Gender Differences in Recovery**

Both male and female heroin addicts show dramatic improvements following treatment. However, since they enter treatment with different types and severity of problems, it is not surprising that they sometimes experience somewhat different outcomes.

A one-year follow-up with a large sample of methadone maintenance patients<sup>[25]</sup> found gender similarities and differences in outcomes. Both male and female patients had significantly decreased use of all illicit drugs, including heroin, and increased motivation. They both experienced decreases in family conflict and increases in positive family relationships. Both genders developed healthier peer relationships. Criminal activity also decreased and psychological functioning increased for both groups. However, male patients were more likely than female patients to be employed and to have worked more days in the past six months; males also reported fewer physical health

problems, received fewer treatments for psychiatric problems, reported less family conflict, and engaged in fewer HIV-risk needle sharing behaviors. On the other hand, female patients improved more in the areas of self-esteem, decision-making and conformity to social norms. Female patients also reduced HIV-risky sexual behaviors more than did male patients.

Gender-focused treatment also appears to promote positive outcomes for patients. Women in methadone maintenance treatment programs<sup>[50]</sup> who participated in a special intervention program addressing sexuality and assertiveness, showed more improvements in self-esteem and knowledge of the issues than did women who had chosen not to participate in the program. The frequency in which a woman attended the six sessions also predicted increased treatment retention after the workshop had concluded.

## *Challenges for the 21st Century*

### **Challenges for Prevention**

Heroin will not disappear if society closes its eyes to the problem and does nothing. A recent study estimated the costs associated with heroin addiction in the United States was \$21.9 billion in 1996<sup>[52]</sup>. These costs resulting from lower productivity, increased criminal activities, increased medical care, and increased use of social welfare strike at the very fiber of our society.

A challenge for the twenty-first century is to decrease heroin addiction through prevention and treatment. Heroin use decreases when its availability is low and price is high, and when people (especially the most vulnerable, young people) consider it to be dangerous. The current epidemic of heroin use may be traced to its easy availability and low price as well as to the high purity that allows snorting – which many new users falsely think is “safe.”

Prevention efforts need to focus on reducing heroin’s availability by stemming the import of heroin into the country and by closing down the major internal drug traffic networks. Prevention also will be enhanced if the message gets out that heroin is highly addictive and

extremely “unsafe” regardless of its level of purity, route of administration, or combination with other drugs.

### **Challenges for Treatment**

Treatment of the almost 800,000 Americans addicted to heroin also is a challenge for the twenty-first century. Challenges that face the treatment field are to develop more effective treatments and combinations of treatments; to match effective treatments to the individual needs of patients; and to increase the availability of treatment to address the needs of all addicts who seek it.

### **Develop More Effective Treatments**

Currently available drug-free and medication treatments are effective in helping some of the people, some of the time. None of the medication maintenance therapies is a panacea and all drug treatment methods require additional professional services and counseling to address the totality of patient needs.

Treatment retention appears to be a major predictor for successful outcomes. As we have seen, motivation plays an important role in the patient’s willingness and ability to stay in treatment. Therefore, increasing the patient’s motivation for treatment and recovery is the focus of promising new therapeutic approaches in addiction treatment. It is now possible to use standardized instruments to measure a patient’s level of motivation and to follow empirically-tested treatments to increase motivation<sup>[53]</sup>.

Another predictor of treatment success is the patient’s commitment to abstain from all non-prescribed drugs and alcohol. Increasing evidence suggesting the potential for any drug of abuse to serve as a relapse trigger is influencing medication maintenance programs to adapt the drug-free treatment communities’ goal of complete abstinence. Likewise, drug-free treatment programs are increasingly aware that not all patient needs may be solved with addiction and psychosocial counseling, but are acknowledging the role of appropriate pharmacological treatments. Effective new treatments for heroin and other drug addictions may be developed through combinations of the most effective elements of existing drug-free and medication therapies.

### **Match Treatments to Patient Needs**

The strategy of matching treatment to a patient's needs is based on the knowledge that patients tend to have successful outcomes when they receive services addressed to their individual needs throughout the various stages of treatment. As we have seen in the discussions about gender issues, for treatment to be successful, the specialized needs of patients must be addressed through specific interventions and programs.

Not all heroin-addicted persons have the same bio-psycho-social and spiritual needs when they are admitted to treatment. Also important, is the recognition that people progress through various stages of treatment and that one's needs may differ according to the stage of treatment. For example, detoxification is a primary stage of treatment that requires intense medical attention that may not be necessary later if the patient is able to remain drug free. However, the patient's need for job counseling, education, and/or parenting skills may increase as he or she moves into a drug-free lifestyle stage. The Federal Center for Substance Abuse Treatment has published a comprehensive manual that addresses the issues involved with matching patients to appropriate treatments at the appropriate stages of treatment<sup>[17]</sup>.

### **Increase Treatment Availability**

It has been estimated that as many as 2,603,000 treatment slots are needed to provide treatment for drug addiction in the United States – these slots would add to the 950,000 slots that already exist<sup>[26]</sup>. Without a sufficient number of accredited addiction treatment programs and without ample certified professional staff, even the best and most effective treatments will not be able to reduce the costs of heroin addiction.

Effective addiction treatment is labor-intensive. It takes a lot of trained staff to address the complex needs of patients. A challenge for the twenty-first century is to increase the number of programs that train staff and to increase the attraction for people who chose to work in this demanding and rewarding field.

Effective addiction treatment also takes time. Assembly-line short-term programs cannot address the patient's individualized needs. Instead more programs

providing long-term individualized care must be encouraged and financially compensated. A challenge for the twenty-first century is to increase the number of effective programs and the number of patients they can serve.

Development of effective addiction treatments, individualizing treatments to patient needs, and increasing the availability of good treatment programs can be attainable goals and easily reached well within the new century – as long as we remember that heroin addiction is a preventable and treatable disease. However, it will take the effort of everyone to participate in its eradication.

### **Conclusion**

Based on our own experience at the Caron Foundation, we know that initial problems in treating heroin addiction do not have to be insurmountable. By learning from our own patient research on the bio-psycho-social aspects of heroin addiction and the research literature on effective addiction treatments, we were able to design programs that effectively meet the needs of this population. We have shown that it is possible and realistic both to increase the lengths of treatment stays and reduce the rates of unusual early discharges for heroin addicted patients to comparable rates for other chemical addictions. The people who come to us for the treatment of heroin addiction are now able to receive the same high quality addiction treatment and are offered the same path to recovery as those who suffer from other chemical addictions.

However, treatment needs are not static, but constantly change with shifts in patient demographics and heroin use and other drug practices. It is essential that the field of addiction treatment continue to revise and develop new treatment programs based on the careful monitoring of indicators of patient needs and treatment effectiveness. It also is essential that we continue to incorporate the best evidenced-based treatments into our programs. As we identify, develop and utilize effective treatments for heroin addiction, we will meet the challenges of the twenty-first century. Such is Caron's commitment!

## End Notes

1. Wren, C.S. 9 May 1988. For heroin's new users, a long, hard fall. *New York Times*. B: pp. 29, 34.
2. Zielbauer, P. 21 March 2000. Student's death and arrests shock Trinity College in Hartford. *New York Times*. B: pp. 1, 7.
3. Raghavan, S., and R. Ciotta. 10 October 1999. Cheaper and stronger, heroin finds new victims in suburbs. *Philadelphia Inquirer*. A: pp. 1, 26.
4. Stine, S.M., and T.R. Kosten. 1999. Opioids. *Addictions: A comprehensive guidebook*. New York: Oxford University Press, pp. 141–61.
5. Castro, F.G., et al. 1999. Ethnic and cultural minority groups. *Addictions: A comprehensive guidebook*. New York: Oxford University Press, pp. 499–526.
6. National Institute on Drug Abuse. October 1997. Heroin: Abuse and addiction. Research report series (NIH publication 97-4165). Washington, D.C.: Superintendent of Documents, U.S. Government Printing Office.
7. Epstein, J.F., and J.C. Gfroerer. August 1997. Heroin abuse in the United States (OAS working paper, RP0919). Rockville, Md.: Office of Applied Studies, Substance Abuse and Mental Health Services Administration.
8. What is the flow of heroin trafficking around the world? Addiction search weekly question online [cited 15 January 2001]. Available: <http://www.cia.gov/cia/di/products/cncweb>.
9. Summary of findings from the 1999 National Household Survey on Drug Abuse. August 2000. Rockville, Md.: Office of Applied Studies, Substance Abuse and Mental Health Services Administration.
10. Johnston, L.D., P.M. O'Malley, and J.G. Bachman. 2000. The monitoring the future national survey results in adolescent drug use: Overview of key findings, 1999 (NIH publication 00-4690). Rockville, Md.: National Institute on Drug Abuse.
11. Rowan, A., et al. 2001. Characteristics of adolescents in residential treatment for heroin dependence. Unpublished manuscript.
12. Gordon, S.M., J. Honer, and R. Snyderan. 2001. Heroin-addicted patient characteristics and drug use histories. Caron Foundation unpublished data.
13. Gordon, S.M. 15 November 2000. Report on adult patients 1999/2000. Caron Foundation unpublished report.
14. Gossop, M., P. Griffiths, and J. Strang. 1994. Sex differences in patterns of drug taking behaviour. *British Journal of Psychiatry*. 164: 101–4.
15. Griffiths, P., et al. 1994. Transitions in patterns of heroin administration: A study of heroin chasers and heroin injectors. *Addiction*. 89: 301–9.
16. Carpenter, M.J., M.A. Chutuape, and M.L. Stitzer. 1998. Heroin snorters versus injectors: Comparison on drug use and treatment outcomes in age-matched samples. *Drug and Alcohol Dependence*. 53: 11–15.
17. Budney, A.J., W.K. Bickel, and L. Amass. 1998. Marijuana use and treatment outcome among opioid-dependent patients. *Addiction*. 93(4): 493–503.
18. Kauffman, J.F., and G.E. Woody. (Consensus Panel co-chairs). 1995. Matching treatment to patient needs in opioid substitution therapy. Treatment improvement protocol 20. Rockville, Md.: Center for Substance Abuse Treatment, Substance Abuse and Mental Health Services Administration.
19. Robins, L., J. Helzer, and D. Davis. 1975. Narcotic use in Southeast Asia and afterward. *Archives of General Psychiatry*. 32: 955–61. Cited in Tarter, R.E., and A.C. Mezzich. 1992. Ontogeny of substance abuse: Perspectives and findings. In Glantz, M., and R. Pickens, eds. 1992. *Vulnerability to drug abuse*. Washington, D.C.: American Psychological Association, pp. 149–77
20. Barber, W.S., and C.P. O'Brien. 1999. Pharmacotherapies. *Addictions: A comprehensive guidebook*. New York: Oxford University Press, pp. 347–69.
21. Effective medical treatment of opiate addiction. 17–19 November 1997. NIH consensus statement online (cited 15 January 2001). Available: <http://odp.od.nih.gov/consensus>.
22. Carroll, M.E. 1999. Prevention and treatment of drug abuse: Use of animal models to find solutions. In Glantz, M.D., and C.R. Hartel, eds. *Drug abuse: Origins and interventions*. Washington, D.C.: American Psychological Association, pp. 149–59)
23. Mason, B.J., J.H. Kocsis, D. Melia, et al. 1998. Psychiatric comorbidity in methadone maintained patients. *Journal of Addictive Diseases*. 17(3): 75–89.
24. Nunes, E.V., et al. 1994. Evaluation and treatment of mood and anxiety disorders in opioid-dependent patients. *Journal of Psychoactive Drugs*. 26(2): 147–53.
25. Chatham, L.R., et al. 1999. Gender differences at admission and follow-up in a sample of methadone maintenance clients. *Substance Use and Misuse*. 34(8): 1137–65.
26. Powis, B., et al. 1996. The differences between male and female drug users: Community samples of heroin and cocaine users compared. *Substance Use and Misuse*. 31(5): 529–43.
27. Gombert, E.S.L. 1999. Women. *Addictions: A comprehensive guidebook*. New York: Oxford University Press, pp. 527–41.
28. Principles of drug addiction treatment: A researched-based guide. October 1999. (NIH publication 99-4180). Rockville, Md.: National Institute on Drug Abuse.
29. Hser, Y., C. Chou, and M.D. Anglin. 1998. Relationships between drug treatment careers and outcomes. *Evaluation Review*. 22(4): 496–519.
30. Knight, D.K., and D.D. Simpson. 1996. Influences of family and friends on client progress during drug abuse treatment. *Journal of Substance Abuse*. 8(4): 417–29.
31. Snyderman, R. n.d. Working with heroin addicts: A therapist's perspective. Caron Foundation unpublished paper.
32. De Leon, G., G. Melnick, and D. Kressel. 1997. Motivation and readiness for therapeutic community treatment among cocaine and other drug abusers. *American Journal of Drug and Alcohol Abuse*. 23(2): 169–89.
33. Wasserman, D. A., et al. 1998. Factors associated with lapses to heroin during methadone maintenance. *Drug and Alcohol*

## End Notes, continued

*Dependence*. 52: 183–92.

34. Llorente del Pozo, J.M., et al. 1998. Psychological and behavioral factors associated with relapse among heroin abusers treated in therapeutic communities. *Addictive Behaviors*. 23(2): 155–69.

35. Magura, S., P.C. Nwakexa, and S. Demsky, 1998. Pre- and in-treatment predictors of retention in methadone treatment using survival analysis. *Addiction*. 93(1): 51–60.

36. Nicotine craving and heavy smoking may contribute to increased use of cocaine and heroin. 20 February 2000. NIDA news release online (cited 17 January 2001) Availability: <http://www.nida.nih.gov/MedAdv/00/NR2-20.html>.

37. Ling, W., R.A. Rawson, and M.A. Compton. 1994. Substitution pharmacotherapies for opioid addiction: From methadone to LAAM and buprenorphine. *Journal of Psychoactive Drugs*. 26(2): 119–28.

38. Hartel, C.R., and M.D. Glantz. 1999. The treatment of drug abuse: Changing the paths. In Glantz, M.D., and C.R. Hartel, eds. *Drug abuse: Origins and interventions*. Washington, D.C.: American Psychological Association, pp. 243–84.

39. Seoane, A., G. Carrasco, and L. Cabre, et al. 1997. Efficacy and safety of two new methods of rapid intravenous detoxification in heroin addicts previously treated without success. *British Journal of Psychiatry*. 171: 340–45.

40. Rabinowitz, J., H. Cohen, and R. Tarrasch, et al. 1997. Compliance to naltrexone treatment after ultra-rapid opiate detoxification: An open label naturalistic study. *Drug and Alcohol Dependence*. 47: 77–86.

41. Sheehan, T., and P. Owen. 1999. The disease model. *Addictions: A comprehensive guidebook*. New York: Oxford University Press, pp. 268–86.

42. O'Connell, D.F. 23 June 1997. Results of the heroin withdrawal study. Caron Foundation unpublished report.

43. Caron Foundation. n.d. Unpublished data.

44. NAATP Benchmarking Graphs (1999). National Association of Addiction Treatment Providers unpublished data.

45. Ward, J., W. Hall, R.P. Mattick. 1999. Role of maintenance treatment in opioid dependence. *Lancet*. 353(9148): 221–26.

46. Marion, I.J. (Consensus Panel chair). 1995. LAAM in the treatment of opiate addiction. Treatment improvement protocol 22 (DHHS publication [SMA] 95-3052). Rockville, Md.: Center for Substance Abuse Treatment, Substance Abuse and Mental Health Services Administration.

47. Mumford, G. 2000. Washington agonizes over a partial-agonist. *Psychological Science Agenda*. 13(5): 12–13.

48. Strain, E. C., et al. 1996. Buprenorphine versus methadone in the treatment of opioid dependency: Self-reports, urinalysis, and addiction severity index. *Journal of Clinical Psychopharmacology*. 16(1): 58–67.

49. O'Connor, E. 2001. Law sanctions new treatment for heroin addiction — and recommends psychological counseling. *Monitor on Psychology*. 32(1): 18.

50. Bartholomew, N.G., et al. 1994. Effectiveness of a specialized intervention for women in a methadone program. *Journal of Psychoactive Drugs*. 26(3): 249–55.

51. Hubbard, R.L., S.G. Craddock, and P.M. Flynn, et al. 1997. Overview of 1-year follow-up outcomes in the Drug Abuse Treatment Outcome Study (DATOS). *Psychology of Addictive Behaviors*. 11(4): 261–78.

52. Mark, T.L., et al. 2001. The economic costs of heroin addiction in the United States. *Drug and Alcohol Dependence*. 61: 195–206.

53. Yahne, C.E., and W.R. Miller. 1999. Enhancing motivation for treatment and change. *Addictions: A comprehensive guidebook*. New York: Oxford University Press, pp. 235–49.

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Caron Adolescent Treatment Center  
Male Adolescent Extended Care  
Young Women's Extended Care  
Galen Hall Road  
Wernersville, PA 19565-0150  
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Center for Self Development  
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Extended Care for Men  
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