

Death after Treatment for Heroin Dependence

"The operation was a success but the patient died"

By Kenneth Anderson - Tolerance for opioids can easily increase ten-fold with regular opioid use; likewise tolerance can drop back down to its original level after a period of abstinence leaving the user extremely vulnerable to death by opioid poisoning at this time. [Ninety percent or more](#) of opioid poisoning deaths are actually polydrug poisoning resulting from drug mixing which is why we will be using the term drug poisoning in this article. Education about drug mixing is an extremely important aspect of overdose prevention.

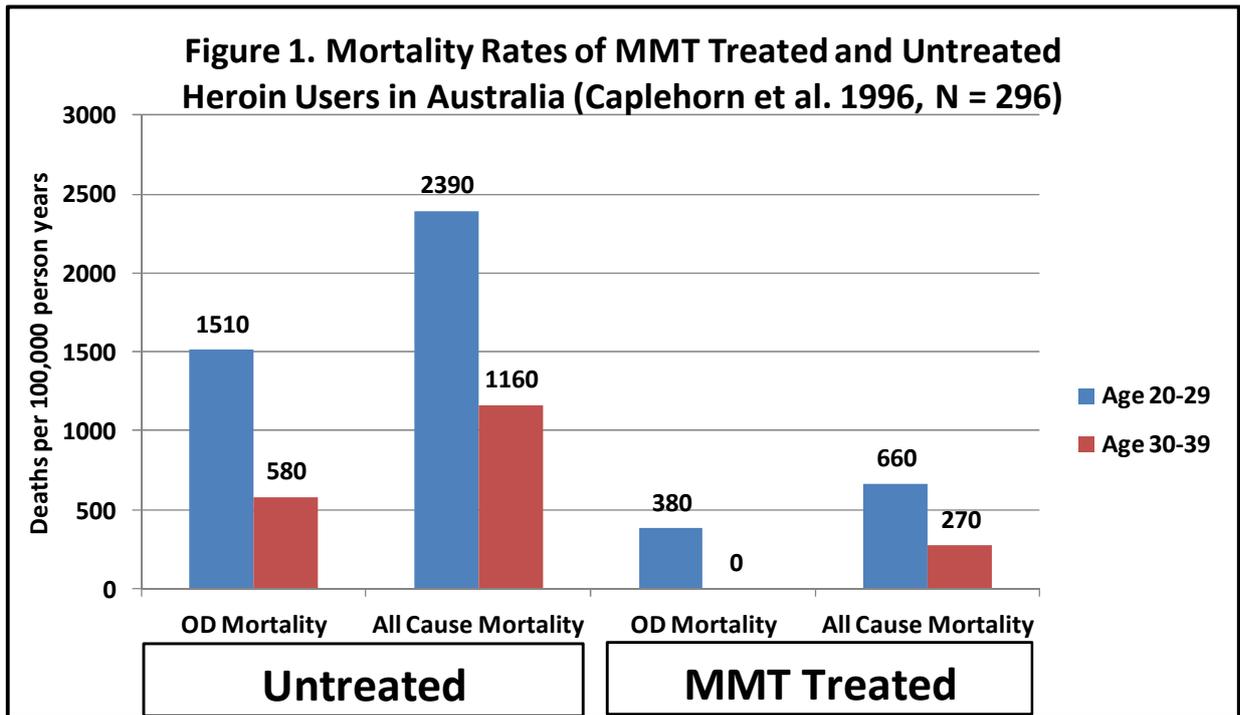
Methadone maintenance treatment programs (MMTs) and therapeutic communities (TCs) which offer long term stays have been shown to have a strong protective effect against drug poisoning deaths for heroin users for as long as users remain in treatment. The evidence also suggests that people who graduate from MMTs and TCs have good outcomes. However, people who leave MMTs and TCs prematurely because they drop out or are kicked out are at greatly increased risk for drug poisoning death compared to untreated heroin users.

Successful graduates of 28 day abstinence-based rehab programs are at the greatest risk for drug poisoning death of any population because of lowered tolerance; those who continue to use heroin during 28 day treatment or drop out early are far less at risk than successful graduates of these programs. Newly released inmates are at far greater risk of drug poisoning death than the general public or inmates in prison.

Because of this increased risk of death after treatment or incarceration, overdose prevention training and Narcan (naloxone) distribution ought to be mandatory at every treatment facility and correctional facility in the United States. Although a few areas such as New York State have made progress in this direction, the country as a whole lags behind and remains mired in a slough of ignorance and overdose death.

The Protective Effect of Methadone Maintenance

Numerous studies have demonstrated that Methadone Maintenance Treatment (MMT) reduces drug poisoning mortality roughly 75% compared to untreated heroin users. A seminal study by [Caplehorn et al. \(1996\)](#) followed a cohort of 296 Australian heroin users over a period of 15 years with the results shown in Figures 1 (note that the cohort was divided into two age groups: 20-29 and 30-39 years old):



Protective Effects of Other Forms of Treatment

Since MMT had been demonstrated protective against overdose death for those in treatment, [Davoli et al. \(2007\)](#) decided to investigate whether other forms of treatment also showed protective effects against drug poisoning death for those in treatment, as well as investigating if there were elevated death rates after leaving treatment. The study was carried out in Italy and the subjects were 10,454 Italian heroin users. Figure 2 shows the opioid poisoning death rates for those in treatment and for those who left. It also gives death rates for those who died during the first 30 days after leaving treatment and for those who died after being out of treatment for longer than 30 days. Table 1 gives the actual numbers of individuals who died.

Figure 2. Drug Poisoning Death Rates During and After Leaving Treatment (Davoli et al. 2007)

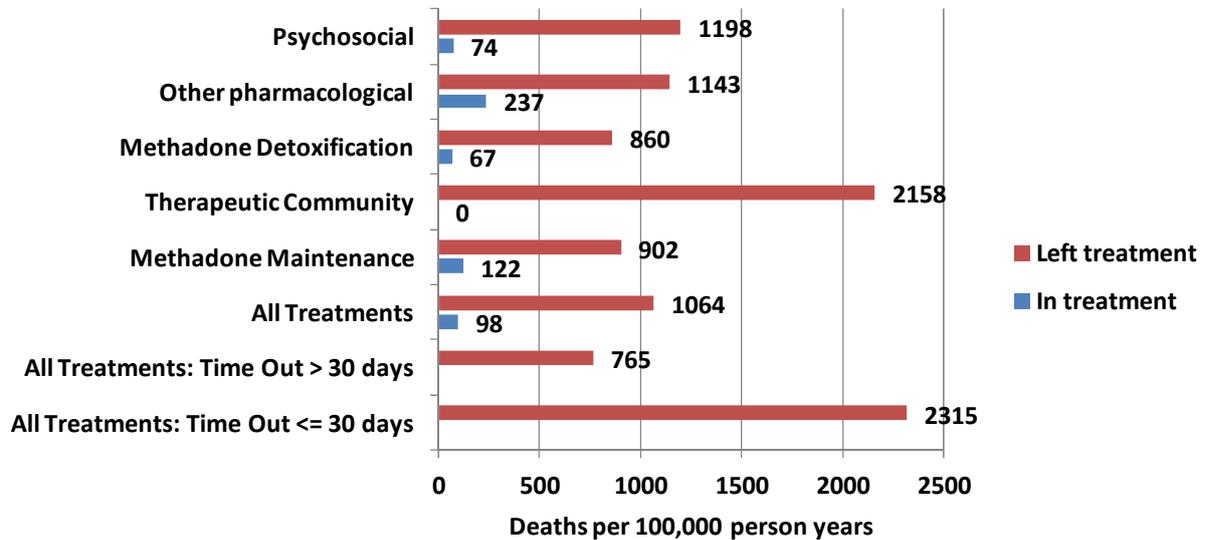


Table 1. Deaths by Treatment Type During Treatment and After Leaving

Treatment Type	In treatment		Left Treatment	
	Deaths	Person years	Deaths	Person years
All Treatments	10	10,207.72	31	2,913.79
All Treatments: Time Out <= 30 days	NA	NA	13	561.44
All Treatments: Time Out > 30 days	NA	NA	18	2,352.36
Methadone Maintenance	7	5,751.28	9	997.68
Therapeutic Community	0	1,188.94	5	231.74
Methadone Detoxification	1	1,495.72	7	814.06
Other pharmacological	1	422.59	7	612.2
Psychosocial	1	1,349.23	3	250.46

As we can see, all treatments offered substantial protection against drug poisoning deaths as long as the clients remained in treatment. However, there were high death rates after leaving

treatment, particularly during the first 30 days. It is reasonable to assume that these high death rates in the first 30 days are the result of lost tolerance.

It is also important to note that all 9 overdose deaths from the methadone maintenance cohort were treatment drop outs; no successful graduates of methadone maintenance suffered overdose death. Likewise, 4 out of 5 of the TC cohort who suffered overdose death were dropouts, only one was a successful graduate. On the other hand, 6 out of 7 of the methadone detoxification cohort who suffered overdose death were successful graduates of the program; only one who died was a drop out. This suggests that programs which rapidly detoxify dependent heroin users and place them quickly back on the street put these users at high risk of overdose death. We shall see this phenomenon again below when we look at 28 day rehab programs.

What Is the Drug Poisoning Death Rate for Untreated Heroin Dependence?

Determining the mortality rate due to drug poisoning for untreated heroin dependence is not a simple task; it is likely that this number varies greatly from cohort to cohort and time and place. Cohorts which only snort heroin and avoid drug mixing will have far lower mortality rates than cohorts which inject and mix drugs. For the sake of this article we are going to assume that the death rate of untreated, dependent heroin users is 1,000 deaths per 100,000 person years. This number seems reasonable if we look at the death rates for the two untreated cohorts in Figure 1: 1510 for 20-29 year olds and 580 for 30-39 year olds. If we split the difference we obtain approximately 1,000.

It is also possible and fairly simple to calculate the mortality rates for all heroin users in the US, treated and untreated, dependent and non-dependent. We can do this by simply dividing the number of heroin poisoning deaths (obtained from [CDC WONDER](#)) by the number of users (obtained from [SAMHSA](#)). If we do so then we see that there is a huge variation in the death rates for all users going from a low of 373 deaths per 100,000 person years in 2006 to a high of 1213 in 2013. It is possible that rate increases in recent years are due to naive users who are unaware of the dangers of drug mixing. Given these numbers it also seems reasonable to assume a death rate for untreated, dependent users of around 1,000 deaths per 100,000 person years, particularly since one may assume that the death rate for dependent users is higher than that for all users.

Drug Poisoning Death Rates after 28 Day Rehab

Preliminary investigations by [Strang \(2003\)](#) suggest extremely high death rates after the successful completion of 28 day rehab with full heroin detoxification. Those who failed to successfully complete the program had lower death rates due to the fact that they had not lost their tolerance. There were 137 subjects in the Strang study. Out of 37 people successfully completing 28 day opiate detox and rehab, 3 had died of drug poisoning within 4 months,

giving us a whopping opioid poisoning death rate of 32,432 deaths per 100,000 person years. None of the 100 non-completers died of heroin poisoning.

Strang is not the first investigator to report increases in death rate after 28 day rehab, [Gossop et al. \(1989\)](#) had also reported such increases as had other investigators. However, the alarmingly high rates found by Strang call urgently for further investigations of death after 28 day rehab with a much larger cohort size.

Drug Poisoning Death Rates after Incarceration

[Binswanger et al. \(2007\)](#) found inmates during the first two weeks after release from prison were 129 times more likely to die of drug poisoning than the general public. Rates of drug poisoning death for ex-inmates were 1840 deaths per 100,000 person years in the first two weeks and 181 deaths per 100,000 person years over the long term. Great care must be taken not to draw mistaken conclusions when comparing the treatment cohorts to the inmate cohorts. The fact that the overdose rate is far lower for the inmate cohorts does NOT prove that incarceration is a better option than treatment because we are looking at totally different populations. All individuals in the treatment cohort were in treatment for heroin dependence and it is reasonable to assume that all met the criteria for heroin dependence. Moreover, overdose deaths in the treatment cohorts involved opioids, possibly mixed with other drugs.

The inmate sample, on the other hand, was a random sample of inmates released from prison, the majority of whom had never been heroin dependent. According to [Albizu-García et al. \(2012\)](#), the lifetime prevalence of heroin dependence among US prison inmates is 15%. According to the 2004 National Inmate Survey, 8.2% of inmates had used heroin within a month of offending. Additionally, it is uncertain how many inmates were drug-free during the course of their incarceration. Finally, [Binswanger \(2013\)](#) notes that among the earlier cohort of inmates (1999-2003), cocaine was the primary drug involved in the largest number of overdose deaths, whereas in the later inmate cohort (2004-2009) opioids were the most frequently involved drugs. Thus, only a small number people from the inmate cohorts were former heroin users who had been abstinent.

Putting It All Together

Figure 3 summarizes the data we have about drug poisoning death after recent release from treatment or incarceration, and Figure 4 gives the numbers for the death rates long term after release from treatment or incarceration.

Figure 3. Short Term Post Treatment or Post Incarceration Drug Poisoning Death Rates

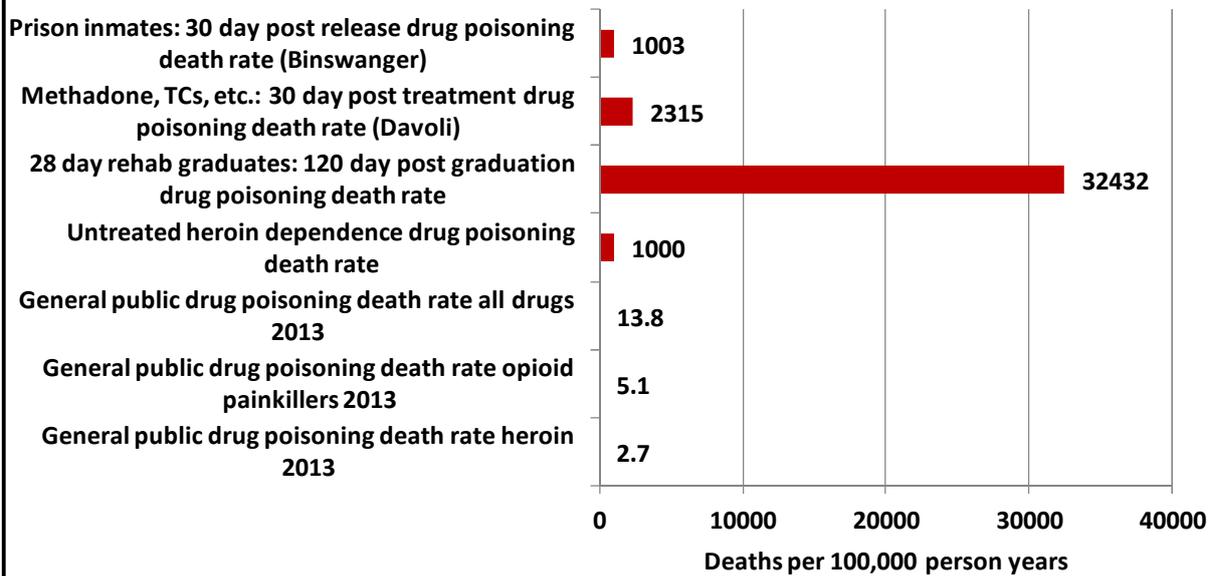
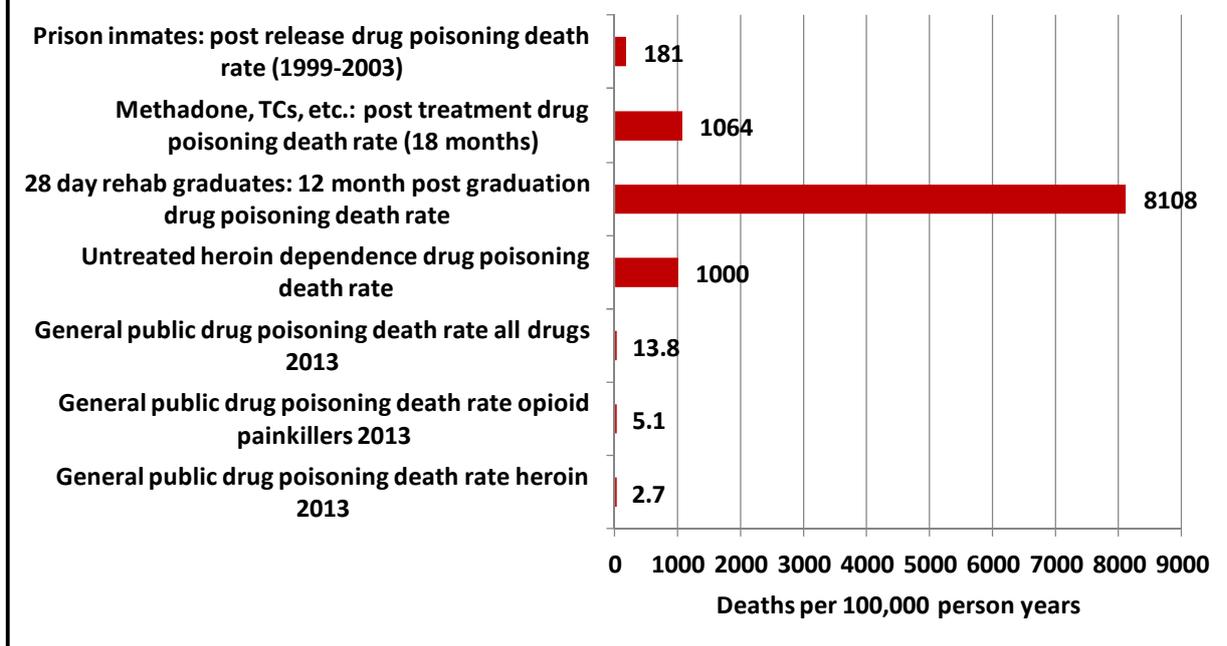


Figure 3. Thirty day post incarceration death rates for prisoners were calculated as follows:
 $(\text{number of deaths}) / (\text{number of releases}) * 365 / 30 * 100,000$

Figure 4. LongTerm Post Treatment or Post Incarceration Drug Poisoning Death Rates



As we can see from Figure 3, dependent heroin users completing 28 day abstinence based treatment are 32 times more likely to die of overdose within the first 4 months after release than are dependent heroin users who receive no treatment at all. The data we see above also suggest that methadone detoxification programs may also lead to hugely increased death rates in the short term; however, no studies of this specific phenomenon appear to have ever been conducted. It is shocking that there is no agency in the US tracking deaths after treatment or other treatment outcomes.

Types of Heroin Treatment Utilized in the US

The data we have seen above suggest that methadone maintenance treatment (MMT) and therapeutic communities (TCs) both have a protective effect against heroin poisoning deaths. It is likely that this is because both of these types of treatments are long term treatments which can last a year or more and hence give heroin users enough time away from heroin to adjust to life without it. However, data from [TEDS](#) (Treatment Episode Data Set) show that in 2012, only 27.6% of heroin users undergoing treatment in the US received some form of medication assisted treatment (MAT), which could range from methadone or buprenorphine maintenance to methadone or buprenorphine detoxification. Only 8.8% were in a therapeutic community (TC). In other words, there is a real dearth of protective treatments, i. e. methadone maintenance and TCs, in the US.

The First 14 Days on Methadone

It is important to note that the first 14 days on methadone is a time when clients are at a greatly increased risk of overdose death. Narcan (naloxone) is an essential for these clients.

Does Treatment Have To Last a Lifetime?

No. The research shows that those who drop out of treatment or are kicked out have the worst outcomes. Those who graduate from treatment when they are ready have the best outcomes. In the case of methadone this includes a slow and gradual taper off the methadone. [Ball and Ross \(1991\)](#) followed up 105 patients who had left methadone treatment for one year. Twenty three had successfully completed the program. At the one year follow up date, 7 of the 23 had returned to treatment, 7 had abstained since leaving treatment, 7 were actively using heroin, and 2 had relapsed but were no longer using heroin. Two of those who returned to treatment had never relapsed. Hence, the relapse rate of the successful graduates was 14/23 or 61%. The relapse rate for the entire 105 was 82%. The percentage of successful graduates showing good outcomes was $(7 + 7 + 2)/23 = 16/23 = 70\%$. Hence, the program graduates did better than the non-graduates. Transitions from methadone maintenance to successful abstinence are common, but the data suggests that people should be maintained on methadone as long as they wish.

New York State Initiatives

New York State has been at the forefront of introducing overdose prevention training into both addiction treatment centers and the prison system. All state operated treatment programs in New York State are slated to provide overdose prevention training and provide Narcan (naloxone), and as of this writing a large number already do. In addition, many private providers in New York State have initiated overdose prevention training and Narcan distribution, including such traditional programs as Daytop Village, Odyssey House and Phoenix House. Here is the New York State [Opioid Overdose Prevention Programs Directory](#).

New York is also at the forefront of overdose prevention training and Narcan (naloxone) distribution in prison. The Lower East Side Harm Reduction Center has been offering overdose prevention training and distributing Narcan (naloxone) to friends and family of inmates at Riker's Island since 2012. New York State offered the first overdose prevention training at Queensboro Correctional Facility in [February 2015](#). This program is expected to [expand statewide](#) to all 54 correctional facilities. Inmates who complete the training can receive an overdose prevention kit with Narcan (naloxone) upon release.

Conclusions

All treatment programs and correctional programs in the US need to institute overdose prevention training and hand out Narcan (naloxone) kits.

Thorough investigation of death rates following 28 day treatment and rapid methadone or buprenorphine detoxification is called for as graduates of such programs appear to have extremely high overdose death rates.

Do NOT send your loved one to any treatment program that does not include overdose prevention training and Narcan (naloxone) in the curriculum.

Protective treatments like methadone and TCs need to be greatly expanded in the US.

Twenty eight day rehabs put dependent heroin users at a high risk for overdose death after treatment and should possibly be eliminated.

Rapid detox with methadone or buprenorphine also puts dependent heroin users at a high risk for overdose death after treatment and should possibly be eliminated.

The first two weeks of methadone initiation are high risk for overdose--use caution.

Remember, money talks and bullshit walks. The way to convince rehabs to institute overdose prevention training and medication assisted treatment is to stop sending them clients until they do.