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Clinical Characteristics of Treatment-Seeking Prescription Opioid versus Heroin using Adolescents with Opioid Use Disorder

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1. Introduction

Rising opioid use among adolescents is of emerging public health concern (Compton and Volkow, 2006; Zacny et al., 2003). During the past 5 years, while annual prevalence of heroin use among 12th graders has remained steady (approximately 0.9%), rates of non-medical use of prescription opioid analgesics has risen 135% (from 6.7-9%, (National Institute on Drug Abuse, 2007). Parallel to these rising trends, nationwide admissions to publicly funded substance abuse treatment programs in the U.S. in 2004-5 (Substance Abuse and Mental Health Services Administration Office of Applied Studies, 2007d) show that approximately 5000 teenagers ages 12-17 years entered treatment for a primary heroin or “other opioids or synthetics” problem. Substantial harm from the rising abuse of prescription opioids is reflected in a 24% increase in opioid-related hospital Emergency Department (ED) visits in 2005 compared to 2004 (Substance Abuse and Mental Health Services Administration Office of Applied Studies, 2007b); and a 91% increase in number of deaths from opioid analgesic poisoning between 1999 and 2002 (Paulozzi et al., 2006).

Despite these concerns, there is limited information on clinical populations of adolescents addicted to opioids. Available studies using treatment samples have either examined those with opioid abuse/dependence as a single group (i.e. not distinguished by type of opioid: heroin vs. prescription opioid analgesic use, Gordon et al., 2004; Marsch et al., 2005; Subramaniam et al., 2008); or focused only on heroin users entering treatment (Clemmey et al., 2004; Hopfer et al., 2000). Information on illicit use of opioid analgesics among teenagers is not available for clinical samples but there is information from secondary analyses of two community-based surveys: 2002 Monitoring the Future Study (McCabe et al., 2005; National Institute on Drug Abuse, 2007) and the 2002 National Survey of Drug Use and Health (Substance Abuse and Mental Health Services Administration Office of Applied Studies, 2007c; Sung et al., 2005).

Findings from both community-based and treatment samples have revealed similar characteristics. Both the heroin and the prescription opioid-using samples consisted of older adolescents (16-17 year old) with the majority being male and predominantly of Caucasian

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race. They had poor academic achievement/school problems; polysubstance use was common and many had legal problems. High rates of injection drug use (IDU) were reported among heroin users but not prescription opioid users. Examining mental health symptoms, Clemmey et al, (2004) reported high depressive symptoms and mental distress among treatment-seeking heroin users while Sung et al (2005) found that illicit opioid users compared to non-illicit opioid users in the community were more likely to have seen a therapist. Our prior study (Subramaniam et al., 2008) showed that 83% of adolescents entering treatment with opioid use disorder (OUD) had a DSM-IV Axis-I psychiatric disorder but it is not known if the rates of psychiatric disorders differ by type of opioid being abused.

Given the striking lack of data on prescription opioid-using youth despite their rising numbers, we conducted secondary analyses of data from a large (N = 94) group of treatment-seeking adolescents with OUD (Subramaniam et al., 2008) to compare characteristics of prescription opioid versus heroin users. Differences found in these two subgroups may be important for understanding risk factors and/or for identifying differential treatment needs.

2. Methods

1.1. Study design and procedures

Data was obtained from a parent study funded by National Institute of Drug Abuse (NIDA) in which 94 adolescents (ages 14-18 years) with a past-year DSM-IV OUD were compared to 72 adolescents with a past-year non-OUD DSM-IV cannabis/alcohol use disorders on demographic, substance use, psychiatric and HIV-risk behaviors. For this study, only the OUD participants were selected and divided into two groups: 1) Past year OUD adolescents with any self-reported past 30-day non-heroin prescription opioid use (n = 41) and 2) those reporting any heroin use in the past 30 days whether or not they also reported any prescription opioid use (n = 53). All participants in the parent (and this) study were administered a selection of assessments that used either self-report or standardized interviews for data collection. These included an assessment for demographic and social features (interview), Composite International Diagnostic Interview – Substance abuse module (CIDI-SAM) for past-year DSM-IV SUD diagnoses; Diagnostic Instrument for Children and Adolescents-IV (DICA-IV) for Axis-I psychiatric disorders; Beck Depression Inventory (BDI) for self-reported depressive symptoms; Risk Behavior Survey (RBS) for past-30 day sexual and injection drug use (IDU) HIV-risk behaviors; and the General Crime Scale from the Global Assessment of Individual Need (GAIN) for self-reported criminal behaviors in the past year. Additional details on the parent study design and methods have been reported in Subramaniam et al., (2008). Western Institutional Review Board (WIRB), a Johns Hopkins IRB designee, approved the study protocol and all study materials.

1.2. Participants

The study sample (n = 94) mean age was 16.9 years; (S.D. = 1.02); 67% were between 14-17 years of age. Fifty five percent were male; 89% were Caucasian; 35% were on probation while 18% were court referred for treatment. Per definition, all study participants met criteria for DSM-IV OUD abuse or dependence; 88% met criteria for DSM opioid dependence.

As this study sample was recruited from a single treatment site, we compared our results to nationwide data on age matched adolescent substance abuse treatment admissions for problem use of opioids to determine how representative our site data was on comparable patient characteristics. For this purpose, we compared our data from the subset of 14-17 year olds (n = 63) to data on adolescents ages 12-17 years in the TEDS dataset (Substance Abuse and Mental Health Services Administration Office of Applied Studies, 2007d). From this data base of publicly funded substance abuse treatment admissions in the US, we extracted those between

12-17 years old entering with a primary problem of heroin (n= 2758) or prescription opioids (n=2201). The timeframe of TEDS admissions was from 2004-5, which matched the study recruitment period.

1.3. Setting

The study was conducted at an adolescent substance abuse treatment program whose features are described elsewhere (Clemmey et al., 2004; Fishman, 2003). Adolescents with OUD typically enter the residential setting at this treatment center; these residential admissions contributed 69% (n = 65) of the study sample (33 heroin, 32 prescription opioid users). Twenty of the study participants (19=heroin and 1=prescription opioid user) were recruited from the outpatient NIDA Clinical Trials Network (CTN) study of buprenorphine treatment for opioid dependent adolescents/young adults which was conducted at this site. The remainder (n = 9) were recruited from non-CTN study admissions to its outpatient treatment program.

1.4. Data Analyses

To compare group differences, data were analyzed using Pearson chi-square tests for categorical characteristics and independent t-tests for characteristics with continuous data using SPSS version 13® (SPSS, 2004). The TEDS data were similarly analyzed using Pearson chi-square tests to determine differences between those with a heroin problem vs. those with prescription opioid problem.

3. Results

1.5. Demographic and social characteristics

Table-1 displays these characteristics for the two groups: OUD prescription opioids (n=41) and OUD heroin users (n=53). For the demographic factors examined, both groups were similar: 50-60% were male; most were between the ages of 15-17 years; race was predominantly Caucasian; and residence was outside Baltimore City (i.e., suburban residence). Mean age of OUD heroin group was 17.2 compared to 16.6 yrs for the OUD prescription opioid group (p=0.019, results not shown in Table 1). Both groups were likely to have been in a residential level of treatment at this site, although the prescription opioid group was more likely to be court ordered for treatment.

Of the social factors examined, the two groups did not differ in regards to family characteristics but were significantly different on school-related features. The heroin users were less likely to be in school or to have graduated; prescription opioid users were more likely to report being suspended.

1.6. Substance use characteristics

3.2.1. Substance Use Disorders—Rates of past-year DSM-IV SUD diagnoses were significantly different for the two groups. Compared to the heroin OUD group, the prescription OUD group was more likely to have concurrent cannabis, alcohol, sedative and other stimulant use disorders. Rates of cocaine use disorders were present in over 50% of both groups. The prescription OUD group was also more likely to have multiple SUD (3 or more) diagnoses and significantly greater mean number of past year SUD diagnoses when compared to the heroin users (4.3 vs. 2.8). Almost all heroin users (98%) compared to approximately 3/4th of prescription opioid OUD adolescents met criteria for DSM-IV past-year opioid dependence diagnosis.

3.2.2. Age of Onset—The mean age of onset of meeting criteria for a DSM-IV cannabis and cocaine use disorders (the latter approaching significance) was lower for the prescription

users. The mean age of onset of regular use of marijuana and alcohol (among those with a SUD diagnoses) was significantly lower for the prescription users than heroin users (results not shown in table-2). For both groups, age of onset of regular use and SUD diagnoses were earlier for alcohol and marijuana and later for cocaine and opioids; the mean age of onset of meeting criteria for OUD was on average 6 months following the mean age of onset of regular use of any opioids (15.7 and 15.1 yrs, respectively).

3.2.3. Recent Substance Use—There were significant differences between the groups on rates of past 30-day use of individual substances (SUD diagnoses showed a similar pattern of between group differences,). The OUD prescription opioid group was more likely to have used prescription opioids, alcohol and marijuana (the latter approaching significance) while the OUD heroin group was more likely to have used heroin (per group assignment) and cocaine (the latter approaching significance) and less likely to have used prescription opioids (i.e. 45%) in the past 30 days. Figure-1 illustrates differences in the distribution for self-reported “drug of first choice” for the two groups (Pearson's $X^2 = 64.48$, $p=0.000$). The heroin users reported heroin (77%), prescription opioids (15%), or cocaine (8%) as their first drug of choice. In contrast, the prescription OUD group was more diverse in their report, with marijuana (46%), prescription opioids (27%), cocaine (15%), alcohol (7%) and other drugs (5%) identified as first choice.

Additional analyses of lifetime use (not shown in Table 2) showed that virtually all OUD adolescents had used marijuana and alcohol; and 90% of heroin users reported having ever used prescription opioids. However, fewer prescription opioid than heroin use participants had ever tried heroin (22% vs. 100%, $p=0.000$) or cocaine (70% vs. 98%, $p=0.001$).

3.2.4. Criminal Behaviors—Both groups had high rates of past-year criminal behaviors, but prescription opioids users were more likely to report selling drugs and damaging property. In addition, the prescription OUD group was more likely to initiate these behaviors at significantly younger ages than the heroin group (results not shown in Table-2). However, prescription opioid users were no different from heroin users in rates of being on probation.

1.7. Psychiatric characteristics and treatment history

3.3.1. Current Axis-I DSM-IV Psychiatric Disorders—Overall, both groups had high rates of any psychiatric disorders (83%) but prescription opioid users presented with higher rates of current ADHD and manic episode while there were higher rates of MDE among heroin users (approaching significance). When the data were combined for the two groups, prevalence of psychiatric disorders ranged from CD (53%), MDE or GAD (40%), ADHD (33%) to other disorders (15-26%). Similarly, mean ages of onset of these psychiatric disorders were no different for the two groups with the exception of earlier onset of MDE among prescription opioid users. Both groups reported similar rates of suicide attempts in the past. Rates of admissions on psychotropic medications did not differ between the two groups.

3.3.2. BDI Scores—Although both groups reported moderately high depressive symptoms (15.9 vs. 18.2, n.s.), a higher proportion of heroin users (76 vs. 54%, $p=0.029$) scored in the mild to moderately depressed range (i.e. $BDI \geq 11$) (results not shown in table-3).

3.3.3. Past Treatment Utilization—The heroin OUD group was more likely to have prior SUD or dual diagnoses treatment while more of the prescription opioid OUD group reported having received only past psychiatric treatment. There were some differences in rates of medications prescribed for psychiatric disorders in the past: the prescription opioid OUD was more likely to have taken ADHD meds while heroin users were more likely to have had

medications for anxiety disorders. The groups did not differ for past use of meds for depression or mania.

1.8. HIV/Hepatitis C-risk characteristics

There were substantial differences in rates of IDU. None of the prescription opioid using adolescents reported any past 30-day IDU, while 73% of heroin using adolescents injected drugs and on average injected on 20 out of the past 30-days. Approximately half of injection users in the heroin group reported sharing needles or “works” during this time. Over 3/4th of both groups were sexually active in the past 30-day period but there were no differences on rates of sexual HIV-risk behaviors.

1.9. Comparison of Study Sample with TEDS 2004-5 Sample

A comparison of our single site sample of 12-17 year olds with OUD (n= 63) to the TEDS sample of those with a primary problem with heroin or other opioids (n=4959) showed that the two samples were similar on several of the comparable characteristics (results not shown in tables): 15-17 year olds (our site 97 vs. TEDS 93%); females (44% vs. 49%); Caucasian race (91% vs. 89%); and few with 12 or more years of education (7% vs. 10%). However, they differed on rates of court order to treatment (18% vs. 29%) and proportion receiving treatment in a residential setting (64% vs. 41%). (Substance Abuse and Mental Health Services Administration Office of Applied Studies, 2007d)

4. Discussion

This study provides preliminary information filling critical gaps in the literature by distinguishing between the intake characteristics of a clinical population of prescription opioid-using adolescents meeting criteria for OUD from those of heroin users with OUD. Some of the sociodemographic features reported in this study are consistent with existent literature on heroin users (Clemmey et al., 2004) or prescription opioid users (McCabe et al., 2005); both groups consisted of older teens (mean age 17years; range 15-18 years), predominantly of Caucasian race (89%), with a relatively high proportion of females (45%) compared to typical rates of 31% females in substance abuse treatment samples (SAMHSA Office of Applied Studies, 2007a) and residing in suburban locations (outside of Baltimore City). These findings suggest a common background of origin among OUD adolescents who use heroin vs. prescription opioids. That these teens, despite their social and cultural similarities, have chosen to use different forms of opioid drugs, suggests the existence of differences in drug preferences and/or access among these older, White, suburban OUD teens. How these choices develop is a question that cannot be answered by the data from this study. However, it is clear from anecdotal clinical information that acquisition of heroin versus prescription opioids entails very different scenarios. For example, heroin is typically available from drug dealers in the city; whereas prescription opioids are available through an informal network of suppliers in the suburbs. Thus, there is more risk and effort involved in obtaining heroin. However, prescription opioid use can escalate readily to a habit that is more costly (anecdotal evidence and patient reports suggest that street costs of prescription opioids are higher than equivalent doses of heroin) than a comparable heroin habit, a factor that could shift choice from prescription opioids to heroin. This is also suggested by the study data that while 90% of the heroin users report lifetime prescription opioid use, only 45% report use in the past 30 days. Another factor in the choice is influence by older heroin-using peers and/or sexual partners (especially in the case of females) which may fast track initiation to heroin use. Finally, there are attitudinal factors in play among adolescents. On a national survey, 2 in 5 teens stated that abusing prescription medications was “much safer than illegal drugs” (The Partnership for a Drug Free America, 2006); In addition to this misperception, teens may also express a stigma towards heroin as a

“junkie” drug. Future studies are needed to explore these pathways of selection of opioids among OUD adolescents.

While both groups had multiple comorbidities, the heroin using adolescents stood out on three serious problems areas, which place them at added risk for ongoing problems and long-term debilitation. Heroin users were more likely to: a) have dropped out of school; b) have met DSM-IV opioid dependence diagnosis criteria; and c) report injection use and needle sharing behaviors. Not completing high school (65%) is a serious concern, as it has been linked to life of extended poverty and increased risk for criminal behaviors (Harlow, 2003; Iceland, 2005). Virtually all heroin users (98%) presented with current opioid dependence diagnosis as compared to 76% of prescription users (with the remainder meeting criteria for opioid abuse). Since both groups had average histories of opioid use of approximately 2 years, this suggest that progression to dependence on opioids is faster for heroin than for the prescription opioids, or that those who became dependent on pills have switched to heroin. Alternatively, the dose and frequency of opioid use maybe generally lower among prescription opioid than heroin users so that dependence takes longer to develop with prescription opioids than with heroin. These and other trajectories need further examination. Whatever the pathway, progression to opioid dependence is a risk because it places adolescents in a more advanced and compulsive use stage of addiction, which may make them more resistant to treatment. Recent heroin use by an intravenous route was seen exclusively in the heroin group (73% vs. 0%) with half of intravenous users reporting sharing needles. These behaviors are well known high risk factors for Hepatitis-C and HIV infection (Center for Disease Control and Prevention, 2002, 2007) with potential for severe and debilitating medical illnesses associated with high morbidity and mortality.

Prescription opioid users, on the other hand, manifested with a very different clinical profile. First, they were likely to use and abuse a larger number of non-opioid substances including marijuana, alcohol, sedatives and other stimulants and to present with multiple concurrent SUD diagnoses. Second, they were more likely to be court ordered to current treatment. Finally, despite high rates of psychiatric disorders for the two groups, the prescription opioid users were more likely to have current ADHD, be prescribed medications for ADHD and have received past psychiatric treatment.

The prescription opioid users self-reported preference for a variety of substances as “drug of first choice” (unlike the overwhelming preference for heroin among heroin users). This suggests that teens who report marijuana as their drug of first choice may benefit from closer screening for abuse/dependence on other substances for which they report a less favorable preference/liking. However, adolescents who present with histories of abusing multiple substances pose a challenge to treatment planning because polydrug users may be motivated to stop opioids but not other substances. Furthermore, multiple substance use has been linked to poorer treatment outcomes (Ciraulo et al., 2003). The selection of sedatives and other stimulants (which are also prescription medications) for polysubstance use is consistent with a “pill” subculture and a marketplace within suburban communities and also consistent with the lower risk perception of pill abuse (The Partnership for a Drug Free America, 2006).

It was also interesting that prescription opioid users were 5 times more likely to be court ordered to treatment (34% vs. 6%) even though both groups resided in the suburbs and had similar rates of criminal behaviors and probation status. A possible explanation may lie in the type of criminal acts in which these youth engaged (e.g. drug selling and property damage) leading to more juvenile justice involvement, and subsequent treatment referrals. It is also possible that the prescription opioid users were more likely to commit their crimes within suburban environments and thus more easily come to the attention of local criminal justice authorities.

A final distinguishing feature was the higher prevalence of current ADHD (47% vs. 21%), higher rates of having been prescribed medications for ADHD (56% vs. 19%) and higher utilization of psychiatric treatment in the past (68% vs. 41%) among the prescription opioid users. In the case of these youth, the disruptive nature of higher rates of ADHD (and school suspension) may have resulted in better identification by the school systems leading to the use of psychiatric services. The higher rate of prior prescriptions for ADHD medications needs to be explored further to determine if it suggests either self-medicating and/or priming for prescription medication abuse. Prior engagement in psychiatric treatment has also been reported among prescription abusing opioid dependent adults in methadone maintenance treatment (Brands et al., 2004).

High rates of depression among adult heroin users has been well documented, which is consistent with the somewhat higher rates of MDE in the heroin versus prescription opioid use samples in this study. Since age of onset of MDE (12.5 years) preceded the age of onset of OUD (15.7 years), this study supports the theory that MDE is a potential risk factor in the development of heroin dependence. It is also likely that the MDE was perpetuated by a difficult and distressed lifestyle of heroin addicted youth.

The differences highlighted above ought not to overshadow important similarities. Both groups presented with substantial psychiatric comorbidity. Over 3/4th had a DSM Axis –I psychiatric disorder and over half had two or more disorders. Moderate depressive symptoms (mean BDI scores of 16.9) were reported in both groups. Another important similarity was that approximately 40% of the study sample engaged in recent sexual HIV-risk behaviors such as having multiple sexual partners and always having unprotected sex. For both groups, marijuana or alcohol served as a precursor to regular use of opioids. The treatment implications of these findings are that most OUD adolescents may benefit from expanding the focus of treatment to include integrated psychiatric treatment and HIV-risk reduction education.

4. 1. Limitations

This is a treatment-seeking sample; therefore, results may not generalize to community populations. The small sample size precluded separating out mixed users of heroin and prescription opioids from those who used one or the other type of opioid exclusively. A more refined analysis might shed additional light on the risk patterns of opioid use among adolescents. Since this was a cross-sectional study, we were unable to make causal inferences. The use of outside informants and urine drug screens may have increased the validity of self-reports, although we attempted to address this issue by informing participants of a Federal certificate to ensure their confidentiality and conducting interviews by well-trained psychiatrists and/or research staff. The predominantly residential treatment sample may have biased results as those assigned to residential levels of care typically present with higher severity and co-occurring psychiatric disorders.

4. 2. Implications and future directions

The differential profiles of prescription opioid and heroin using adolescents that emerged in this study have implications for treatment. Despite the fact that very few OUD adolescents receive opioid agonists/antagonist medications during SUD treatment (SAMHSA Office of Applied Studies, 2007d) evidence is emerging that buprenorphine is effective in the management of opioid dependent youth (Marsch et al., 2005; Woody et al., 2008). While heroin users present a profile which suggests that they would benefit from agonist treatment, future studies are needed to determine if opioid agonists have a role in the treatment of prescription opioid users who have a mixed profile of drug use and who may not always meet opioid dependence criteria. Further study is needed to determine if differences in baseline profiles between the two groups influence treatment outcomes. The results also suggest the need for

tailored treatments for this “special needs” population of OUD adolescents, that presents with multiple co-occurring problems. Treatment is needed both to serve the group as a whole and to specifically target the drug preference subtypes addressing their unique needs.

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Figure 1.
Self-reported “Drug of First Choice” Among Prescription-using and Heroin-using Adolescents
with Opioid Use Disorder
Rx Opioid = Prescription opioids

Demographic, Social and Treatment Characteristics: OUD non-heroin Prescription Opioid Users Versus Heroin Users

Table 1

Characteristics	Prescription Opioids (n=41)		Heroin (n=53)		X ²	p value
	n	%	n	%		
<u>Demographic Characteristics</u>						
Female	16	39	26	49	0.94	0.332
15-17 year olds	29	71	34	64	0.45	0.501
Caucasian Race	35	85	49	93	1.22	0.269
Baltimore City Residence [¶]	12	33	14	27	0.42	0.517
<u>Social Characteristics</u>						
Parents Separated or Divorced ^Δ	22	69	30	70	0.01	0.925
Member at Home Using Alcohol/Drugs ^Δ	17	53	21	49	0.14	0.713
In School or Graduated from HS [¶]	26	65	18	35	8.37	0.004
Ever suspended from school	33	97	38	81	4.79	0.029
<u>Current Treatment Characteristics</u>						
Residential setting	32	78	33	62	2.70	0.100
Court Ordered to Treatment	14	34	3	6	12.66	0.000

OUD = opioid use disorder, X² = chi-square value

[¶] missing data on 2 participants

^Δ missing data on 19 participants

Table 2
Substance Use Characteristics: OUD non-heroin Prescription Opioid Users (n=37) Versus Heroin Users (n=57)

Characteristics	Prescription Opioids (n=41)		Heroin (n=53)		X ²	p value
	n	%	n	%		
<u>I. % Past Year DSM-IV SUD Diagnosis</u>						
Opioid	41	100	53	100	N/A	N/A
Cannabis	32	78	22	42	12.63	0.000
Alcohol	30	73	20	38	11.66	0.001
Cocaine [¶]	22	54	27	53	0.01	0.945
Sedatives [¶]	22	54	11	22	10.17	0.001
Other stimulants [¶]	9	22	2	4	7.02	0.008
Multiple SUDs (3 or >) [¶]	34	83	28	55	8.12	0.004
DSM-IV Opioid Dependence Dx	31	76	52	98	11.33	0.001
Mean # of Past Yr DSM-SUD diagnoses	n	mean	se	n	mean	se
	41	4.29	0.31	51	2.80	0.20
<u>II. Mean Age of Onset of DSM SUD^a</u>						
Opioids	41	15.1	0.19	51	15.5	0.16
Marijuana	32	13.3	0.37	22	14.8	0.28
Alcohol	30	14.2	0.20	20	14.9	0.39
Cocaine	22	15.3	0.29	27	16.0	0.20
					t-value	df
					-4.04	90
						p
						0.000
						</

OUD = opioid use disorder, X² = chi-square value

[¶] missing data on 2 participants

^a mean age of onset of each SUD for those with a past year DSM-IV SUD Diagnosis

Table 3
Psychiatric Characteristics and Treatment History: OUD heroin user versus OUD non-heroin Prescription opioid Users

Characteristics	Prescription Opioids (n=41)		Heroin (n=53)		X ²	p value
	n	%	n	%		
% Admitted on any psychotropic medications	18	44	15	28	2.47	0.132
% suicide attempt in the past ^a	10	29	8	17	1.75	0.279
<u>I. % Current DSM-IV Axis-I Psychiatric Disorders^b</u>						
Conduct Disorder	20	56	24	51	0.17	0.684
Oppositional Defiant Disorder	6	17	6	13	0.25	0.617
ADHD	17	47	10	21	6.25	0.012
Major Depressive Episode	10	28	23	49	3.81	0.051
Generalized Anxiety Disorder	13	36	20	43	0.35	0.552
Manic Episode	10	28	5	11	4.05	0.044
Post Traumatic Stress Disorder	11	31	10	22	0.82	0.364
Any Axis-I Psychiatric Disorder	28	78	39	87	1.11	0.379
2 or > Psychiatric Disorders	26	72	26	55	2.49	0.169
Mean # of Axis-I Psychiatric Diagnoses	n	mean	n	mean	se	df
	36	2.4	47	2.1	0.22	81
<u>II. Mean Age of Onset DSM-IV Axis-I Psychiatric Disorders</u>						
Conduct Disorder	17	10.1	23	11.4	1.43	38
Oppositional Defiant Disorder	6	9.7	6	11	0.61	10
Major Depressive Episode	7	11.1	20	13.8	2.39	25
Generalized Anxiety Disorder	10	12.1	19	11.7	-0.31	27
Manic Episode	7	10.6	5	11.8	0.69	10
Post Traumatic Stress Disorder	9	13.1	11	14.5	0.99	18
<u>III. Treatment History</u>						
Type of Past Treatment:	n	%	n	%	X ²	p value
SUD Only	1	3	9	23	7.34	0.025

Characteristics	Prescription Opioids (n=41)		Heroin (n=53)		
Psychiatric Only	21	68	16	41	
SUD and Psych Treatment	9	29	14	36	
% Prescribed Medications in the Past ^a					
For ADHD	19	56	9	19	11.77 0.001
For Depressive Disorders	13	38	24	51	1.31 0.269
For Mania	8	24	4	9	3.53 0.064
For Anxiety Disorders	1	3	11	23	6.55 0.011

^a OUD = opioid use disorder, χ^2 = chi-square value, SD = standard deviation, df = degrees of freedom

^a missing data on 13 participants

Past 30-Day HIV-Risk Behaviors: OUD non-heroin Prescription Opioid Users Versus Heroin Users

Characteristics	Prescription Opioids (n=41)		Heroin (n=53)		X ²	p value
	n	%	n	%		
% Sexual-Risk Behaviors ^a						
Sexually Active	32	78	39	75	0.12	0.731
2 or > Sex Partners	15	47	12	31	1.94	0.164
Always Unprotected Sex	13	41	16	41	0.00	0.973
% Injection Drug Use (IDU) ^a						
Any Lifetime IDU	5	12	40	78	39.91	0.000
Any Past 30-Day IDU	0	0	38	73	44.52	0.000
% Share “works”	n/a	n/a	18	49	n/a	n/a
	n	mean	se	n	mean	se
Mean number of days of IDU	0	0	n/a	38	20.0	0.27
					t-value	df
					n/a	n/a
						p value
						n/a

OUD = opioid use disorder, X² = chi-square value, SD = standard deviation, df = degrees of freedom, n/a = not applicable

^amissing data on 1 participant