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S Y S T E M

<b>Title:</b>	Heroin use is a risk factor for injecting prescription opioids
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## Abstract:

**Context:** For the past two decades prescription opioid (PO) abuse has been an escalating epidemic in the United States. Although there is substantial data on the prevalence of heroin injection, little is known about the injection rates of POs that are self-administered for non-medical reasons.

**Methods:** An ongoing national survey collected data from 5,049 PO abusers who were enrolling in 65 OTPs throughout the United States. Data were collected between March 2010 and February 2012 and include non-medical use and injection of opioids during the past 30 days. Statistical tests compare PO injection between users and non-users of heroin for different POs. Odds ratios were used to examine the relationship between heroin use and PO injection. Finally, demographics, heroin and each of the POs were entered in separate logistic regression equations to generate unadjusted odds ratios and collectively entered in a multivariate logistic regression model to predict any PO injection.

**Results:** Among this PO abusing sample mean age was 33, 54% were male; race/ethnicity was 86% White, 5% Black, 7% Latino. 42% reported injecting any opioid (PO and/or heroin) in the past month and 30% reported injecting a PO. The most frequently abused opioids were oxycodone, hydrocodone, heroin, and methadone (frequency type used was pills 61%, liquid 19%, disk 10%, unknown >= 10%). The most frequently injected opioids (with base N representing number who used that drug) were heroin, hydromorphone, tapentadol, and morphine. 19% reported using buprenorphine in the past month and 21% reported injecting it (207/982). All POs examined were significantly more likely to be injected by heroin users than by non-heroin users. 42% of the heroin users compared to 21% of non-heroin users had injected a PO (OR 2.68; CI 2.37 to 3.03). The most frequent POs injected by heroin users were hydromorphone, tapentadol, morphine, fentanyl and oxycodone (34%-58%). The most frequent POs injected by non-heroin users were hydromorphone, morphine, fentanyl, oxycodone, and buprenorphine (16%-41%). In the bivariate model Age, White race/ethnicity, Employed, First OTP episode, and identifying a PO (rather than heroin) as the primary drug were each negatively associated with PO injection. White race/ethnicity and a PO as the primary drug dropped out of the model in the multivariate analysis. In both models PO injection was positively associated with use of 6 opioids (heroin, morphine, hydromorphone, buprenorphine, fentanyl, and tapentadol) and negatively associated with hydrocodone and methadone use. PO injection was also

positively associated with oxymorphone and tramadol in the bivariate analysis. In the multivariate model, oxymorphone became negatively associated with PO injection and tramadol dropped out of the model.

**Conclusion:** A significant minority (30%) of PO abusers enrolling in OTPs inject prescription opioids. Heroin use is strongly associated with injection of POs. Demographic characteristics associated with PO injection include being older, not employed, and having previously been in an OTP. Some POs, e.g., hydrocodone and methadone, appear to serve as “protective” factors in that users of these drugs were less likely to inject POs (of any type) than PO abusing OTP enrollees who did not use these drugs. Targeted HIV/HCV prevention and screening protocols may be needed for PO abusers especially those with a history of heroin use.