Do heroin overdose patients require observation after receiving naloxone?

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Abstract

Context: Heroin use in the US has exploded in recent years, and heroin overdoses requiring naloxone are very common. After awakening, some heroin users refuse further treatment or transport to the hospital. These patients may be at risk for recurrent respiratory depression or pulmonary edema. In those transported to the emergency department, the duration of the observation period is controversial. Additionally, non-medical first responders and lay bystanders can administer naloxone for heroin and opioid overdoses. There are concerns about the outcomes and safety of this practice as well.

Objectives: To search the medical literature related to the following questions: (1) What are the medical risks to a heroin user who refuses ambulance transport after naloxone? (2) If the heroin user is treated in the emergency department with naloxone, how long must they be observed prior to discharge? (3) How effective in heroin users is naloxone
administered by first responders and bystanders? Are there risks associated with naloxone distribution programs?

**Methods:** We searched PubMed and GoogleScholar with search terms related to each of the questions listed above. The search was limited to English language and excluded patents and citations. The search was last updated on September 31, 2016. The articles found were reviewed for relevance to our objective questions. Eight out of 1020 citations were relevant to the first 2 questions, 5 of 707 were relevant to the third question and 15 of 287 were relevant to the fourth question. *In the prehospital environment, does a heroin user revived with naloxone always require ambulance transport and what are the medical risks if ambulance transport is refused after naloxone?* The eight articles were all observational studies done either prospectively or retrospectively. Two studies focused on heroin overdoses and included 1069 patients not transported to the hospital. No deaths occurred in this group. In counting the patients from all eight studies, some of which included non-heroin opioid overdoses, there were 5443 patients treated without transport and four deaths from rebound opioid toxicity. The number needed to transport to save one life (NNT) is 1361. Adverse effects were mostly related to opioid withdrawal. *If a heroin user is treated in the ED, how long must the patient stay under observation before being safe for discharge?* Five articles addressing the duration of ED observation required for patients treated with naloxone for opioid overdoses. Although a wide range of observation durations were reported, one study supported observing patients for one hour. If after this period the patient mobilizes as usual, has normal vital signs, and a Glasgow Coma Scale of 15, they can be discharged safely. *What are the likely risks in heroin users following naloxone use by lay bystanders or first responders?* Of the 15 relevant papers, a systematic review reported a 100% survival rate in eleven studies and a range of 96–99% survival in the remaining four. Two other studies suffered from poor follow-up and had lower success rates of 83% and 89%. Few if any risks were associated with opioid overdose prevention programs in which lay people were trained to administer naloxone.

**Conclusions:** Patients revived with naloxone after heroin overdose may be safely released without transport to the hospital if they have normal mentation and vital signs. In the absence of co-intoxicants and further opioid use there is very low risk of death from rebound opioid toxicity. For those patients treated in the ED for opioid overdose, an observation period of one hour is sufficient if they ambulate as usual, have normal vital signs and a Glasgow Coma Scale of 15. Patients suffering opioid toxicity can be administered naloxone safely by first responders and trained lay people. Programs that train these individuals are likely safe and beneficial, however further research is necessary.

**Keywords:** Heroin overdose, treat-and-release, emergency medical services, antidote