

**Critical Review Form
Prognosis**

PGY-4

Rudolph SS, Jehu G, Nielsen SL, Nielsen K, Siersma V, Rasmussen LS.
Prehospital treatment of opioid overdose in Copenhagen--is it safe to discharge
on-scene? Resuscitation. 2011 Nov;82(11):1414-8.

Objectives: "to describe our experience with the discharge-on-scene policy used over a 10 year-period with focus on 2-day mortality." (p. 1414)

Methods: This retrospective chart review from Copenhagen, Denmark, included all patients with suspected opioid overdose evaluated by the Medical Emergency Care Unit (MECU) between 1994 and 2003. Per protocol, patients with opioid overdose were administered 0.8 of naloxone IV, supplemented by 0.4 mg IM of subcutaneously at the physician's discretion. It was standard practice that such patients be released on scene if "a substantial and lasting improvement of vital signs is obtained as assessed by the treating physician." (p. 1415) The date and time seen and whether or not naloxone was given were abstracted from the MECU charts. All overdose cases with a Danish social security number were checked for survival data with the Central Personal Registry, and autopsy reports on all subjects who died within 48 hours of MECU contact were collected. Mandatory toxicological screening was a part of these autopsy reports, and included the substance most likely to be the cause of death.

Patients who died within 48 hours of MECU contact were further classified as "rebound toxicity unlikely" or "rebound toxicity likely" based on police investigations: patients seen alive more than 6 hours after MECU contact were classified as "rebound toxicity unlikely." The primary outcome was the risk of dying from rebound toxicity within 48 hours of being released by the MECU. During the study period, 4762 episodes of opioid toxicity were attended by the MECU, in 3245 (68.1%) of which a positive patient identification was obtained. Of these cases, 2241 (69.1%) were released on scene.

Guide		Comments
I.	Are the results valid?	
A.	<p>Was the sample of patients representative? <i>In other words, how were subjects selected and did they pass through some sort of "filtering" system which could bias your results based on a non-representative sample. Also, were objective criteria used to diagnose the patients with the disorder?</i></p>	Yes. These were patients with suspected opioid overdose who received naloxone by the MECU. Only those patients released without transport were included.
B.	<p>Were the patients sufficiently homogeneous with respect to prognostic risk? <i>In other words, did all patients share a similar risk from during the study period or was one group expected to begin with a higher morbidity or mortality risk?</i></p>	Uncertain. We are provided no information with regards to the route, dose, or type of opioid ingestion, all of which could impact the probability of rebound toxicity.
C.	<p>Was follow-up sufficiently complete? <i>In other words, were the investigators able to follow-up on subjects as planned or were a significant number lost to follow-up?</i></p>	Likely yes. Follow-up was completed by checking survival data in the Central Personal Registry, which purportedly contains information regarding all deaths of Danish citizens that occur in Denmark.
D.	<p>Were objective and unbiased outcome criteria used? Investigators should clearly specify and define their target outcomes before the study and whenever possible they should base their criteria on objective measures.</p>	Mostly yes. Deaths within 48 hours of MECU contact were classified as either "rebound toxicity likely" or "rebound toxicity unlikely" based on whether or not they were seen alive 6 hours following naloxone administration. Some subjectivity could be introduced using this time cutoff, and the authors do not specifically discuss who made such a determination.
II.	What are the results?	
A.	<p>How likely are the outcome? In other words, how many patients had the outcome of interest?</p>	<ul style="list-style-type: none"> • There were 18 deaths within 48 hours identified among those with positive patient identification who were released on scene, for an all-cause mortality rate of 0.80% within 48 hours. • Four cases were excluded: 2 patients were not given naloxone, one case was admitted to the hospital after MECU contact for an unrelated reason, and one subject committed suicide by hanging. Thus, 14 cases (0.62%) of possible rebound opioid toxicity leading to death were identified.

		<ul style="list-style-type: none"> Opioid rebound toxicity was found to be the likely cause of death in 3 cases (0.13%, 95% CI 0.04 to 0.39%).
B.	<p>How precise are the estimates of likelihood?</p> <p><i>In other words, what are the confidence intervals for the given outcome likelihoods?</i></p>	
III.	<p>How can I apply the results to patient care?</p>	
A.	<p>Were the study patients and their management similar to those in my practice?</p>	<p>Uncertain. The authors do not provide any demographic information on the included patients, nor do they provide information on dose, route, or formulation of the opioids ingested. Lastly, the MECU differs greatly from our typical EMS model by the presence of a physician on scene at all calls. The decision to release the patient was therefore based on a physician evaluation, rather than paramedic discretion.</p>
B.	<p>Was the follow-up sufficiently long?</p>	<p>Yes. It is unlikely that any death > 48 hours after naloxone administration could be attributed to rebound toxicity.</p>
C.	<p>Can I use the results in the management of patients in my practice?</p>	<p>Uncertain. Rebound toxicity in this study was low (0.13%), suggesting that patients with an appropriate response to naloxone do not routinely require transport to the hospital. The presence of a physician at the scene in this study to determine whether transport was necessary or the patient could be released makes it difficult to extrapolate the results to our current EMS system (external validity).</p>

Limitations:

- The authors provide no demographic data, and provide no information regarding the dose, route, or formulation of opioid ingested.**
- The presence of a physician at the scene in this study makes it difficult to extrapolate the results to our current EMS system ([external validity](#)).**

Bottom Line:

In this large, retrospective char review of Danish patients with opioid overdose, the risk of rebound toxicity was low (0.13%), suggesting that patients with an appropriate response to naloxone do not routinely require transport to the hospital.

The presence of a physician at the scene makes it difficult to extrapolate these results to our current EMS system, where transport decisions are made by paramedics.