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Preliminary Analysis of Vermont's EMS Naloxone Leave-Behind Program

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Naloxone Leave-Behind Project Preliminary Results Overview

Abstract:

Background: Naloxone is well known to effectively reverse the effects of unintentional opiate overdose and reduce mortality from opiate overdose (12, 18). Despite activation of emergency medical services (EMS) after an overdose, many patients choose against transport to a hospital for further treatment and initiation of support services. These patients were previously left on scene without any additional support or services, despite encountering emergency medical personnel. To supplement the state's naloxone distribution efforts, Vermont initiated an EMS protocol allowing all levels of providers to provide naloxone leave-behind kits to patients and/or their family or friends when a patient is identified as high-risk for opiate overdose and is not transported to a hospital by the responding EMS agency. **Objectives:** To evaluate the preliminary outcomes of Vermont's EMS naloxone leave-behind program. **Methods:** De-identified data was obtained from Vermont's pre-hospital incident reporting tool, SIREN, containing incidents in which patients who were not transported to a hospital were identified by EMS as high-risk for future opiate overdose. The data was divided into two data sets. The first represented a retrospective time period of the 12 months leading up to the naloxone leave behind protocol initiation on 10/01/2020. The prospective data set includes all encounters in the 12-month period after the protocol was started. This analysis includes only the preliminary analysis of the first six months of the protocol. **Results:** In the retrospective time period between October 2019 and September 2020 (prior to starting the naloxone leave-behind program), Vermont EMS agencies responded to 195 incidents where a patient that was subsequently not transported to a hospital met criteria for being high-risk for future opioid overdose. In the preliminary prospective data period, from October 2020 through March 2021 (six months of naloxone leave-behind program), 119 patients were not transported to a hospital and were identified as high-risk for future opiate overdose. Of the 119 patients, 69 patients were offered a naloxone leave-behind kit by the responding EMS agency, representing 58% of the target population of high-risk individuals. Of these 69 patients, 59 patients accepted a kit, representing an overall naloxone leave-behind kit distribution rate of 50.0%, and a kit acceptance rate of 85.5%. The high-risk patients who were not transported to a hospital were most often ages 30-39 (48.7%), and 61.7% were male gender.

In response to widespread effects of opiate abuse on communities in the last decade, numerous states have implemented prevention programs focusing on reducing rates of opiate abuse and overdose-related deaths. Primary prevention for opiate abuse and overdose focuses on prevention of over-prescription of narcotics through education, training, prescription drug monitoring programs, among other methods (2). Secondary prevention strategies focus on reducing overdose mortality by use of the opiate-reversal agent, Naloxone, which can be administered via intranasal spray or by intravenous or intramuscular injection. Many states, including Vermont, have substantially increased the awareness and availability of naloxone and its use in the reversal of opiate-related overdoses (12).

As of January 2021, Vermont achieved a waitlist of zero for patients with opiate use disorder waiting to connect with a medication-assisted treatment (MAT) services (14). Importantly, Vermont has also expanded the availability of naloxone resources for both patients with OUD as well as lay people to use throughout the communities, resulting in an increase in bystander administration of the drug in possible overdose events. Vermont's Opiate Overdose Prevention and Reversal Project (OOPRP) provides naloxone kits without judgement and without cost. In 2020 alone, the OOPRP provided the kits which were used to successfully reverse the overdoses of at least 279 people, in addition to the countless other lives saved by these kits which were not reported to OOPRP centers (12). Sadly, there were 157 deaths due to opiate overdose in Vermont during 2020, which is 38% greater than the deaths attributed to opiates in Vermont throughout 2019 (15). A likely explanation for the increased burden of opiates on Vermonters throughout 2020 is the overall worsening of mental health conditions and substance abuse since the COVID-19 Pandemic began in March 2020 (16). Although so much progress has been made to reduce stigma, expand MAT to all corners of the state, and provide convenient and free naloxone distribution sites through the OOPRP, Vermonters are still dying from opiate overdose, and overdose continues to be a common reason for emergency medical activation systems and emergency department visits (15, 17).

Although many EMS protocols state that patients who have received pre-hospital naloxone should be transported to the nearest emergency department for continuation of care, this is not always possible; and many patients refuse transport and all subsequent medical care after experiencing an overdose reversal (5). A new pre-hospital protocol, which is now active throughout the state of Vermont in all EMS agencies, allows all levels of EMS providers to provide a Naloxone Leave-Behind Rescue Kit with all patients identified as high-risk for opiate overdose that do not subsequently undergo transport to a hospital in the encounter. A similar protocol exists in Howard County, MD, where they provide naloxone kits and/or a referral for peer support to all opiate overdose patients (or patient friends or family on scene). However, their program provides the service regardless of disposition of the incident (i.e. regardless of transport status). Howard County Fire and Rescue responded to 239 overdose calls over the 12-month study period and distributed 120 naloxone kits to individuals on the scene of an overdose with a 50.21% distribution rate (8). Also, when compared to patients who were not provided a kit at all, they found that patients were more likely connect with a peer support specialist if a naloxone kit and/or support information was given to a family member (5.19 times more likely) or a friend (3.69 times more likely). When given directly to the patient, they were 2.37 times

more likely to become connected with peer support for addiction over those who were never provided a kit, highlighting the importance of creating a meaningful encounter with OUD patients at every opportunity possible.

The new Vermont leave-behind protocol went into effect on October 1st, 2020. These naloxone kits not only provide patients with an increased chance of survival in the event of future overdose, but they also contain information about addiction support and treatment centers throughout the community. Because of this protocol change, patients who refuse transport to a hospital will have still made a positive, meaningful, and potentially life-saving encounter with the healthcare system, regardless of their decision to seek medical care at the time of the encounter. The goal of this project was to identify the patients who would have benefitted from a naloxone reversal kit in the year prior to the protocol being initiated. This study also looks at data from EMS calls after the protocol was started.

The data was obtained from Vermont's incident reporting system, SIREN, in de-identified data sets from the Vermont Department of Health. The final data set will contain data from the year prior to and year after the protocol went into effect. A preliminary data set was analyzed which contains the first six months of EMS incidents after the protocol began October 1st, 2020.

Results from the retrospective data set (10/1/2019-9/30/2020) included 195 patient encounters where a naloxone leave-behind kit would have been indicated (all patients qualify as high risk for opiate overdose and were not transported to a hospital after an EMS encounter). However, at the time, there was no feasible way for these 195 encounters to positively engage these patients with the healthcare system after activating 911. Between October 1st, 2020 and March 31st, 2021, during the first six months of the Naloxone Leave-Behind Program, SIREN data indicates that 120 patients met criteria for being high-risk for opiate overdose, did not undergo transport to a hospital, and should have been offered a naloxone leave behind kit. Of these 120, 69 patients (57.5%) were offered a kit. When offered a naloxone leave-behind kit, 85.5% accepted the kit (59 patients). 5 patients declined the kit when offered, 4 encounters specified that a kit was not left without documentation for the reason, and 1 encounter documented that a kit was not in stock during an encounter with a high-risk patient. There was no documentation of why no kit was offered or left in the remaining 56 encounters (46.7%) for which a patient met criteria for being high-risk for opiate overdose.

Limitations include missing possible data points primarily in the retrospective data if EMS encounters do not explicitly identify opiates within the SIREN data set the research team selected, however, any patients offered a naloxone leave-behind kit would be included in the data set, so the prospective data set should not be affected by this limitation. Additionally, it is not clear if a kit was declined or if the kit was simply not offered if the supplemental question regarding the status of a kit is left blank by providers. Finally, the de-identified nature of the data set does not show how many encounters are occurring for the same patient.

From a public health perspective, this study may contribute to increased awareness of state-wide addiction support services and improved patient experiences with medical providers that may later allow for increased patient willingness to seek treatment for addiction.

Additionally, this preliminary data review shows that EMS providers are sufficiently able to quickly identify patients at high-risk of opiate overdose, and also effectively able to offer and provide a life-saving naloxone kit when they are otherwise unable to encourage these patients to seek further treatment at a hospital. The high acceptance rate of naloxone leave-behind kits shows that patients also recognize the importance of having a kit on-hand should unintended overdose occur. The demographics (ages 30-49, male gender) of the high-risk patients also reflect the demographics of the patients who experience fatal overdose in Vermont throughout 2020, indicating that this program effectively reaches the target population of Vermonters at highest risk of dying by overdose.

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