


**BRIEF REPORT**

Emergency Medical Services

# At-risk patient documentation and naloxone dispersal for a rural statewide EMS “Naloxone Leave Behind” program

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## Abstract

**Objectives:** For successful Naloxone Leave Behind (NLB) programs, Emergency Medical Services (EMS) must identify patients at-risk for opioid overdose. We describe the first year of Vermont’s NLB program and report rates of EMS documentation of at-risk patients with subsequent distribution of NLB kits in the subgroup of those refusing transport to an emergency department (ED).

**Methods:** This retrospective cohort review of all EMS encounters over 1 year compared on-scene EMS documented to retrospective chart review identified at-risk patients eligible for NLB kit dispersal. EMS was educated to identify at-risk patients through statewide mandatory training modules. At-risk patients were identified by electronic chart review using the same training criteria. As per protocol, patients identified as at-risk by EMS who refuse ED transport are eligible for NLB. NLB-appropriate patients by retrospective chart review without NLB protocol use documentation by EMS were considered “missed.”

**Results:** Of 110,701 EMS encounters, 2507 (2.4%) were at-risk by chart review. Among these, 793 refused transport to an ED. In this chart-review at-risk non-transported group, EMS documented 407 (51.3%) patients as at-risk by documenting use of the NLB protocol. Of these 407, EMS provided 141 (34.6%) with NLB kits. Fifteen (3.7%) patients refused kits. There were 386 (48.7%) potentially “missed” opportunities for NLB dispersal.

**Conclusion:** EMS documented 51.3% of patients eligible for NLB dispersal, with 34.6% receiving kits. There was no documentation for 48.7% of chart-review at-risk patients, suggesting “missed” distribution opportunities. This study highlights the need for improved EMS identification of at-risk patients, EMS documentation adherence, and NLB kit provision.

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## 1 | INTRODUCTION

### 1.1 | Background

The United States has some of the highest rates of opioid-related overdoses worldwide.<sup>1-3</sup> In response, many states have implemented primary and secondary prevention programs focused on reducing rates of substance use and overdose-related deaths.<sup>4,5</sup> While primary prevention focuses on reducing inappropriate prescriptions, secondary prevention often focuses on reducing overdose mortality by increasing public access to naloxone.<sup>4,6-10</sup>

### 1.2 | Importance

Although Emergency Medical Services (EMS) protocols state that patients who receive prehospital naloxone should be transported to the emergency department (ED) for continued care, up to 35% refuse transport after initial EMS treatment.<sup>11-15</sup> These rates have doubled since the start of the COVID-19 pandemic.<sup>16</sup> Non-transport after prehospital naloxone administration is associated with a higher risk of subsequent overdose, highlighting the vulnerability of this population.<sup>14</sup> Since hospital-dispensed Take-Home Naloxone (THN) kits do not reach non-transported patients, EMS has a unique opportunity to identify and connect with patients in this particular naloxone "desert."<sup>17</sup>

Naloxone Leave Behind (NLB) programs allow EMS to dispense naloxone to patients who have overdosed, are at-risk for overdosing, or with community members likely to witness an overdose.<sup>18-20</sup> In our Vermont program, NLB kits include 4-mg naloxone nasal spray, instructions for use, and information on local resources for harm reduction and treatment for opioid use disorder (OUD). Many EMS agencies in the United States have existing NLB programs; however, few have reported on their success and there is an overall lack of data on the efficacy of such programs.<sup>18</sup>

### 1.3 | Goals of this investigation

We aimed to provide a description of the first year of Vermont's NLB program and report on how frequently non-transported patients identified as at-risk for opioid overdose by retrospective chart review were also documented as at-risk and provided NLB kits by EMS practitioners on-scene.

## 2 | METHODS

### 2.1 | Study design and setting

This statewide retrospective cohort study was performed in Vermont, a predominantly rural prehospital system with 13 EMS districts, each surrounding an anchor hospital and utilizing uniform statewide EMS protocols and prehospital electronic records (SIREN: Statewide Incident Reporting Network). We performed an electronic chart review

### The Bottom Line

Emergency Medical Services encounters for opioid related complications continue to grow exponentially, with many patients refusing transport. The state of Vermont saw this as an opportunity to implement a Naloxone Leave Behind program. Although acceptance for such naloxone kits was high, with 141 potential lives saved in year one, there was an opportunity with twice as many at risk cases that did not get a kit.

(SIREN database) of all EMS activations in the state over 1 year. We adhered to the STROBE guidelines for observational studies. The State of Vermont Agency of Human Services Institutional Review Board determined this project to be exempt as a de-identified database review.

### 2.2 | Interventions

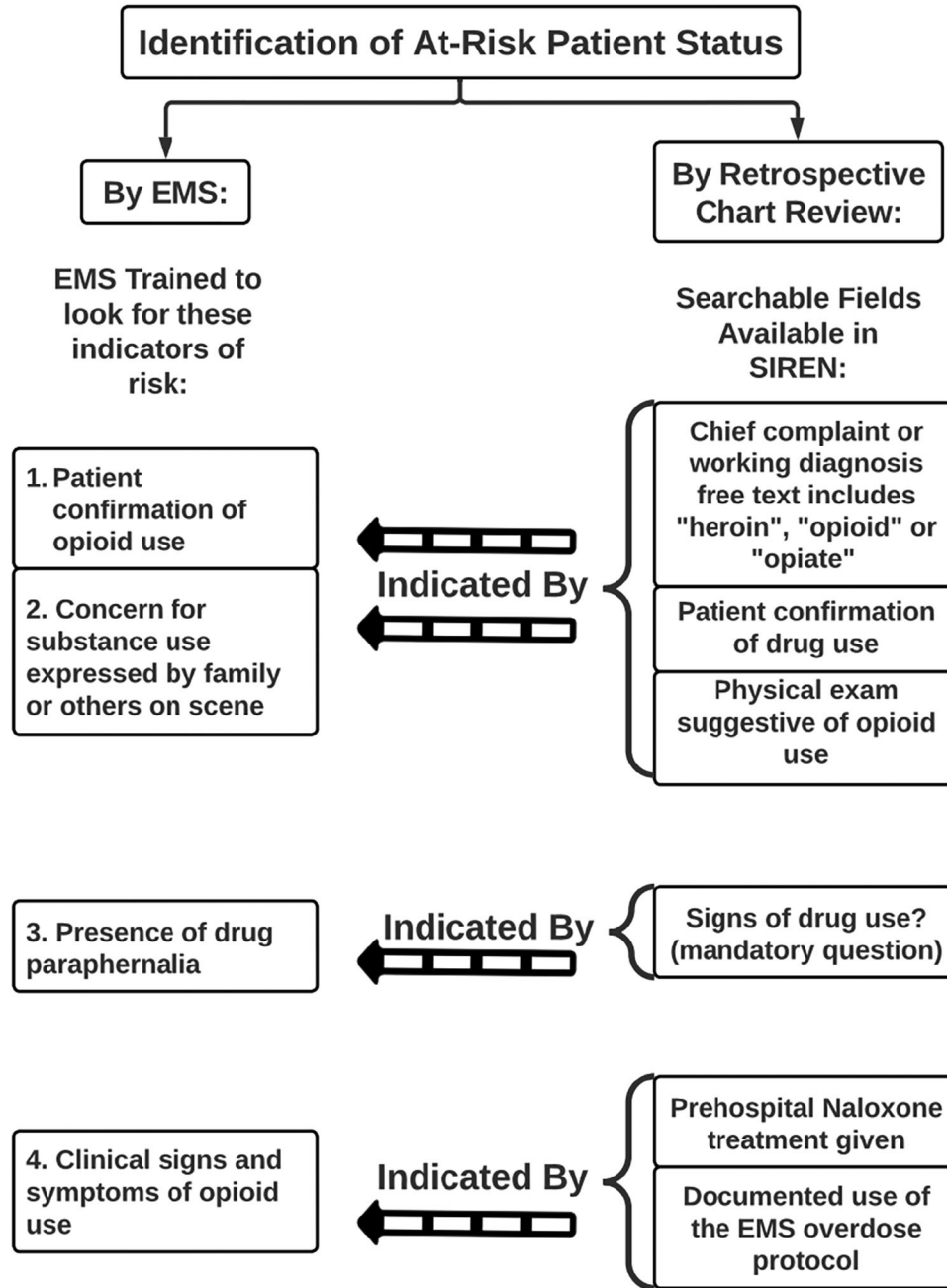
On October 1, 2020, the Vermont EMS office implemented a new statewide NLB protocol for distribution of NLB kits to those at-risk for opioid-related death and refusing transport. During the 3 months prior to protocol implementation, all Vermont EMS practitioners completed mandatory education modules on identifying at-risk patients, criteria for eligibility for NLB kit dispersal, and documentation of the protocol use in the prehospital record. Each Vermont rescue station was provided enough NLB kits to have two available for distribution on every ambulance run. Kits were paid for by the Vermont Department of Health and replenished as needed.

### 2.3 | EMS identification and documentation of at-risk patients

All Vermont EMS practitioners participated in mandatory education on the new NLB protocol use and identification of OUD at-risk patients based on any of the following criteria: (1) patient confirmation of opioid use, (2) concern for substance use expressed by family or others on scene, (3) presence of drug paraphernalia, or (4) clinical signs or symptoms suggestive of opioid use (Appendix 1). If a patient was at-risk and refused transport, they were eligible for an NLB kit. EMS was instructed to document the encounter by completing the NLB protocol fields in SIREN (Appendix 2). These are not required fields in the record. We considered any engagement with the first NLB protocol question (answering "Yes" or "No") as EMS documentation of an at-risk patient encounter.

### 2.4 | Chart review identification of at-risk patients

We performed a retrospective electronic chart review to identify at-risk patients using searchable fields in the SIREN database

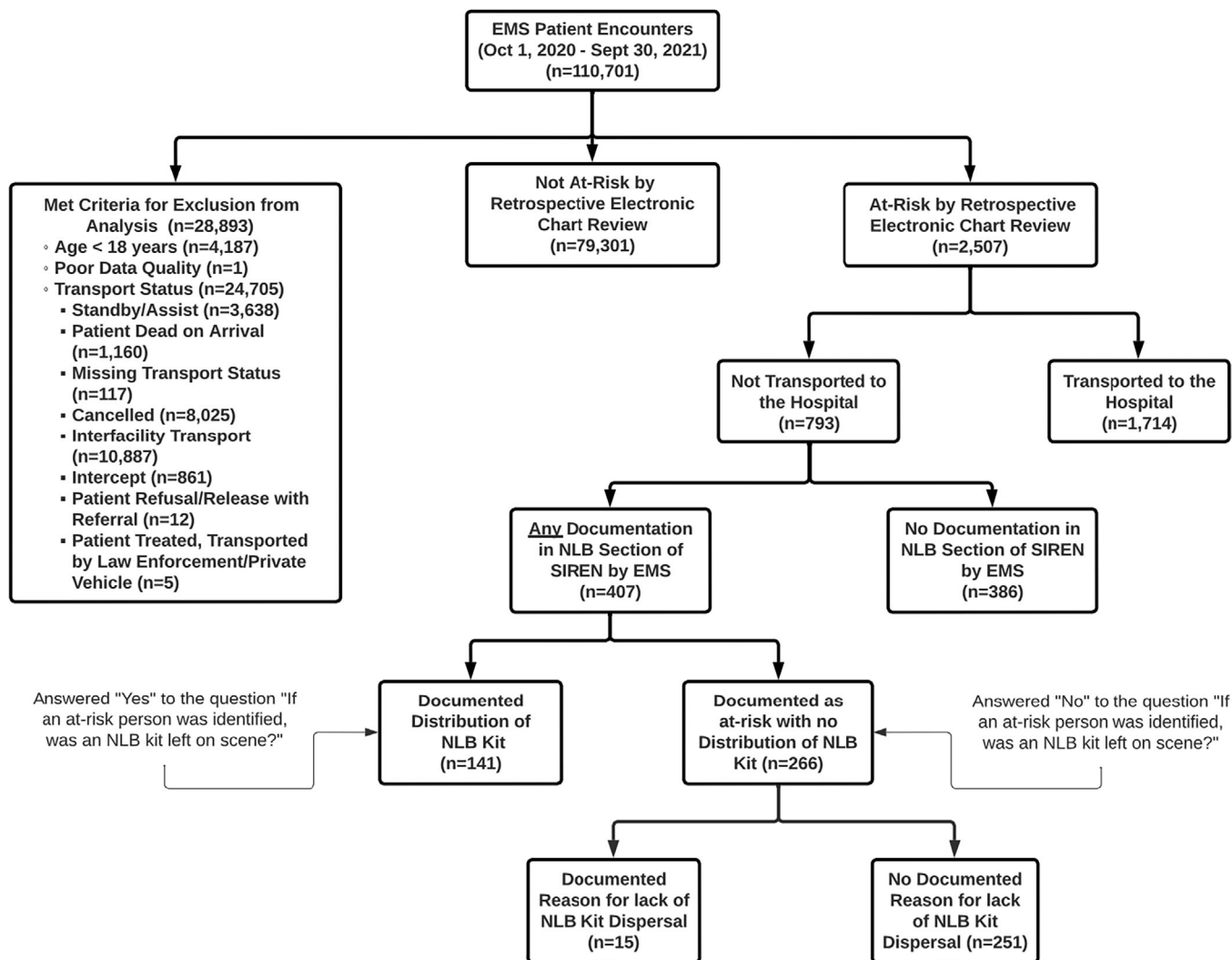


**FIGURE 1** Overdose at-risk status: By Emergency Medical Services (EMS) training criteria and by searchable SIREN database.

equivalent to criteria specified in the mandatory EMS education to identify at-risk status (see Figure 1 for search criteria). All EMS responses to 9-1-1 calls in the SIREN database from the first year of the NLB program (October 1, 2020–September 30, 2021) were considered, excluding children (age < 18 years), standby/assists, patient dead on arrival, missing/poor data, cancellations, interfacility transfers, intercepts, and “other” transport status responses. On-scene signs of drug use were determined by EMS documentation in a required field under “Patient Condition-Assessment” in SIREN that prompts for signs of suspected alcohol or drug use in every patient by required selection of one or more of the following: “Patient Admits to Alcohol use,” “Alcohol Containers/Paraphernalia at Scene,” “Drug

Paraphernalia at Scene,” “Patient Admits to Drug Use,” “Physical Exam Indicates Suspected Alcohol or Drug Use,” “Positive Level known from Law Enforcement or Hospital Record,” or “Not Applicable.” At-risk patients not transported to the ED, our population of interest, were identified by required EMS documentation of transport status.

The authors manually reviewed 5% of the EMS-documented at-risk patient charts and found 100% of this sample was also identified as at-risk by electronic retrospective chart review. Three independent investigators also manually reviewed 5% of the electronic retrospective chart review patients and had unanimous agreement that 100% of this sample was at-risk and therefore eligible for NLB dispersal.



**FIGURE 2** Results flowsheet.

## 2.5 | Outcomes

The main outcome comparisons in this study included (1) rate of EMS documentation of at-risk patients eligible for NLB kit distribution compared to retrospective chart review at-risk patients eligible for NLB, (2) rates of documented NLB kit distribution attempts for both retrospective chart-review and EMS-documented NLB protocol appropriate patients, and (3) overall rates of “missed” opportunities for NLB kit distribution.

## 3 | RESULTS

### 3.1 | Characteristics of study participants

Vermont EMS responded to 110,701 9-1-1 calls between October 1, 2020, and September 31, 2021. There were 81,808 calls meeting inclusion criteria (Figure 2). Based on electronic retrospective chart review of chief complaint, history, and scene reports, 2507 (2.35%) patients

met criteria for being at-risk for an opioid-related overdose, of those 793 refused transport and are our primary population of interest. Of these 793, 58.1% were male, with a median age of 45.3 years, and 13.6% were treated with prehospital naloxone at the scene.

## 4 | MAIN RESULTS

Among non-transported chart-review identified at-risk patients ( $n = 793$ ), EMS documented 407 (51.3%) of these as at-risk patient encounters as indicated by any engagement with the NLB protocol section of SIREN chart (Figure 2; Appendix 2). In 386 (48.7%) of chart-review at-risk encounters, there was no documentation in the NLB section of SIREN, representing potentially missed opportunities for NLB kit dispersal. Of the 407 with NLB protocol use documentation, EMS recorded successful NLB kit dispersal to 141 (34.6%) patients, with 266 patients having no documented NLB Kit dispersal. Among those with EMS documentation of risk in the NLB section but ultimately no documented kit dispersal ( $n = 266$ ), 15 (3.69%) patients

**TABLE 1** Reasons for Naloxone Leave Behind (NLB) kit refusal for Emergency Medical Services (EMS) and chart-review identified at-risk patients who were offered NLB kit but did not accept ( $n = 15$ ).

Why kit not given	<i>n</i>	%
Patient refused	6	40.0
Patient already has	7	46.7
Patient denies use	1	6.7
Other	1	6.7

had a documented reason for failed kit dispersal, while 251 did not (Table 1).

#### 4.1 | Limitations

EMS documentation of NLB protocol use were not required questions in SIREN. Thus, it may be that non-documentation contributed to the low rates of kit dispersal. Although 15 patients had documented reasons for refusal (Table 1), it is possible that there were additional legitimate reasons for not distributing a NLB kit and that unsuccessful kit offers were prone to non-documentation. An additional limitation is the phrasing of the questions presented to EMS in this protocol section that could have led to confusion about encounters documentation, which should have been minimized by the EMS education modules.

Due to the non-mandatory nature of these questions, we do not know why 251 patients were identified by EMS as at-risk but were not offered/given a kit, a limitation that could be changed by a change to required question status. There is no indication that supply chain issues or shortages of kits played any role in dispersal rates.

## 5 | DISCUSSION

There are few other reports on the efficacy of NLB programs. Of those that do exist, they clearly demonstrate why having robust EMS-based NLB programs is so important. Those who receive NLB kits not only have naloxone on hand in the case of future overdoses but are also more likely to be connected to additional treatment resources like Medication for Opioid Use Disorder (MOUD) or harm reduction programs. Scharf et al. demonstrated this when they analyzed one NLB program in Howard County, Maryland, and found that among 143 patients linked to peer recovery specialist services for additional support and treatment, those who received an NLB kit were more likely to be connected with follow-up services, simply by receiving NLB.<sup>18</sup> Similarly, it is less important who the kit is distributed to, but rather that it is just distributed to anyone in a position to act. Scharf et al. showed that if NLB was left with a family member, the patient was five times more likely to be connected to support specialists, and if it was left with a friend or directly with the patient, they were nearly four times more likely to be connected. This finding was recapitulated by LeSaint et al. and suggests that the distribution of naloxone to anyone in

their support circle is more important than distributing it to the patient themselves.<sup>18,20</sup>

Similarly, these investigations report naloxone distribution rates of approximately 50%, similar to our at-risk EMS identification rate. Out of 238 overdose calls, Scharf et al. report 120 successful NLB distributions. We attempted to go one step further to quantify and report on how well EMS not only distributed NLB but also identified and documented at-risk individuals. While there are limitations to our investigation, two findings remain clear: (1) a significant population remains in Vermont who may benefit from additional naloxone distribution efforts, and (2) Vermont needs to enhance the EMS documentation process and reporting of these at-risk individuals and NLB distributions to better understand the efficacy of the existing NLB program.

As the opioid epidemic continues to worsen in the aftermath of COVID-19 and with increasing amounts of opioids being mixed into other drugs like cocaine and methamphetamine without the users' knowledge, it is increasingly important to have a low threshold to effectively identify potential at-risk patients, provide them with naloxone, and accurately document the encounter.

These changes will hopefully enable vulnerable patients to mitigate preventable overdose deaths.

#### AUTHOR CONTRIBUTIONS

Daniel Wolfson, Samantha Hunt, and Jesse Naumann conceived the study. Daniel Wolfson, William Moran, Jamie Benson, Samantha Hunt, Jesse Naumann, and Miles Lamberson supervised the conduct of the trial and data collection. Jamie Benson managed the data, including quality control. Jamie Benson provided statistical advice on study design and analyzed the data. Jesse Naumann drafted the manuscript, and all authors contributed substantially to its revision. Daniel Wolfson takes responsibility for the paper as a whole.

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#### CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

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APPENDIX 1: VT EMS NLB 2022 PROTOCOL

## Naloxone Leave Behind Opioid Overdose Rescue Program

8.11

**NALOXONE LEAVE BEHIND OPIOID OVERDOSE RESCUE PROGRAM ALSO KNOWN AS NALOXONE LEAVE BEHIND KIT**

**BACKGROUND**  
 The opioid crisis is a growing concern in America, and it has become the leading cause of injury-related death in the United States. Naloxone is an opioid antidote that reverses the symptoms of opioid toxicity and associated life-threatening respiratory depression. Providing Naloxone Leave Behind Kits containing 4 mg. nasal spray naloxone doses to patients who have just had an overdose or who have other signs of opioid use disorder (OUD) has been shown to save lives and is a critical intervention EMS can deliver.

**PURPOSE**  
 To provide individuals who have just experienced an opioid-related overdose or who have other indications of OUD (At-Risk Person) with an Naloxone Leave Behind Kit, along with instructions on harm reduction and how to access treatment, in order to potentially prevent a future opioid related death. Indicators of OUD may include patient confirmation of opioid use/OUD, concern expressed by family members or others on scene, presence of drug paraphernalia or clinical signs and symptoms.

**PROCEDURE**

- Identify an At-Risk Person who has experienced an opioid related overdose or has indicators of OUD.
- Complete usual patient care as per Vermont Statewide EMS Protocols. (See [Poisoning/Substance Abuse/Overdose – Adult 2.19A](#) or – [Pediatric 2.19P](#), [Altered Mental Status – Adult 2.3A](#) or – [Pediatric 2.3P](#).)
- Overdose patients who received naloxone by EMS or prior to EMS arrival should be encouraged to accept transport to the Emergency Department.
- Offer a Naloxone Leave Behind Kit to an At-Risk Person if they refuse transport.
- Additionally, offer a kit to an At-Risk Person that has not experienced an overdose but has indications of OUD.
- The Naloxone Leave Behind Kit may also be given to family members, friends or other persons on scene who are in a position to assist the At-Risk Person.
- Provide instructions on how to use the Naloxone Leave Behind Kit along with harm reduction instructions and information handout on how to access treatment for OUD.
- Patients who used Naloxone on scene prior to EMS arrival may be offered a replacement kit.

Follow standard protocol and contact **Medical Direction** for patients who wish to refuse transport. (See [Refusal of Care Policy and Patient Non-Transport Form 8.15](#).)

**DOCUMENTATION**

- In SIREN under Provider Action – Treatment, document if a Naloxone Leave Behind Kit was given and number of kits distributed at the scene. If kit was offered but not left behind, briefly document why.
- Dispensing a Naloxone Leave Behind Kit is an approved activity under Vermont EMS Scope of Practice for all provider levels.

Medical Policy 8.11

E/A/P

Vermont EMS has taken extreme caution to ensure all information is accurate and in accordance with professional standards in effect at the time of publication. These protocols MAY NOT BE altered or modified.

2020

APPENDIX 2: NLB PROTOCOL SPECIFIC SECTION OF THE SIREN PATIENT CARE REPORT

If the Naloxone Leave Behind protocol was utilized, please complete the following 3 questions


If an at-risk person was identified, was a Naloxone Leave Behind kit left with a person on scene?:

Number of Leave Behind Kits distributed at scene:

If a Naloxone Leave Behind kit was offered but not left, behind please document why:

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