



# Development of a "N-Quest" (Naloxone reQuest) mobile application to prevent opioid-related overdose deaths



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## Background

Opioid abuse in the United States has increased significantly each year and has contributed to over half a million deaths from 2000 to 2015, prompting the need for better patient education and easier access to naloxone.

Currently, the opioid antagonist is available over the counter in various pharmacies and facilities across the nation. However, opioid overdose accidents can occur if the naloxone is not delivered in a timely manner.

## Objective

To provide an inexpensive and scalable mobile application to expand naloxone access and to prevent opioid related deaths.

## Methods

- Designed and developed a prototype of a mobile application to allow users to request naloxone from nearby naloxone carriers.
- Conducted extensive literature search using PubMed, US National Library of Medicine, Center for Disease Control and Prevention Web site, and Google Scholar to gather data about current state laws, the opioid epidemic and the importance statistics of naloxone use.
- Conducted research on the development of a mobile application including content, design, graphic, interface, and usability.
- Collaborated with a computer science engineer to develop a prototype using proto.io online application.



Figure 1: Diagram depicts the role of N-Quest in connecting bystanders and naloxone carriers

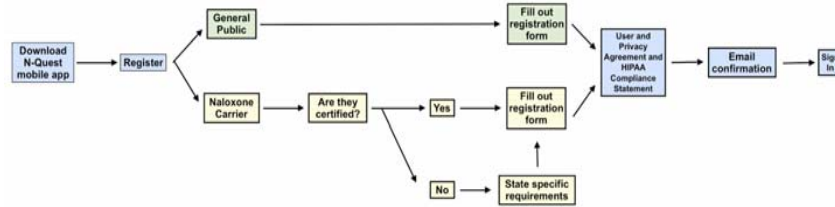


Figure 2: Downloading and registration of the app will allow for users to use and request for help. The app allows users to register as general public or as a certified carrier, and if they are not a certified carrier, the app will give them more information on how to become a carrier in different states.

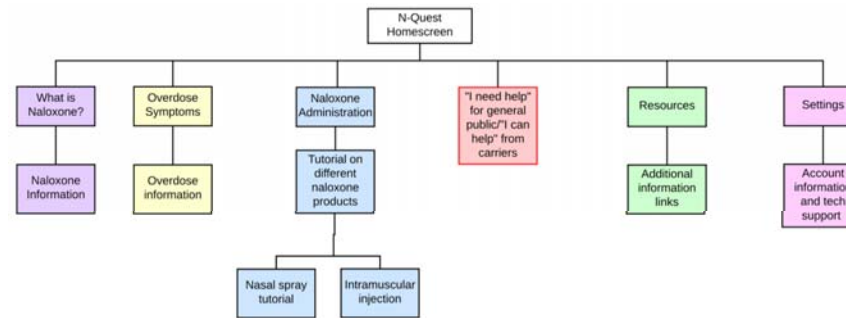


Figure 3: N-Quest homescreen and the different options available for users. Users will be able to read upon general information about naloxone, signs and symptoms of overdose, naloxone administration tutorials, request and confirm help, additional resources, and manage account settings. Options for help will allow for bystanders to activate emergency help. The closest carriers will receive notification from the "I can help" tab.

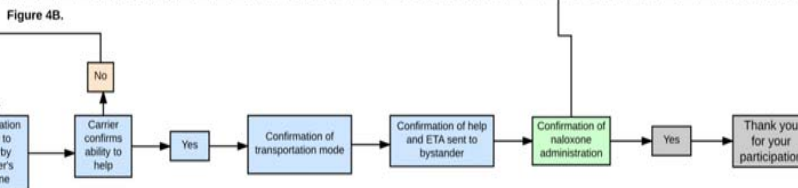
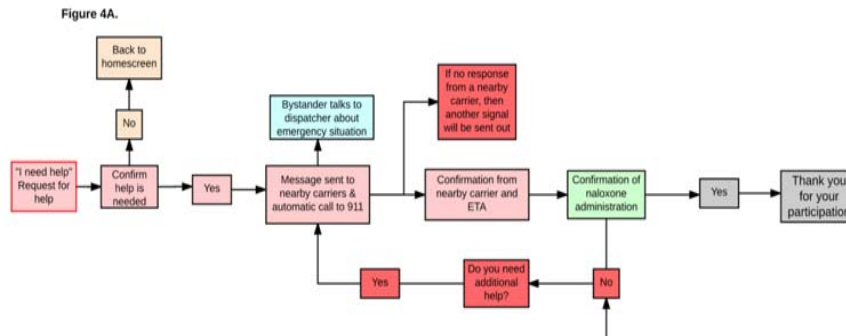


Figure 4A: Process of requesting help for a bystander.

Figure 4B: Process of confirming availability to help from a naloxone carrier. If carrier is not able to help, then another help request will be sent out to the another nearby carrier.

## Results

- After one month, information from literature search was gathered and reviewed and a mobile prototypical application called "N-Quest" (Naloxone reQuest) was produced for the U.S. FDA's 2016 Naloxone App Competition.
- The app was designed to provide quick communication between multiple individuals, including the overdosing patient, bystanders, family members, naloxone carriers, and the Emergency Medical Team (EMT).

## Conclusion

- N-Quest is designed to provide emergency response to opioid overdose incidents by locating nearby naloxone carriers for patients and bystanders and provide education regarding opioid overdose.
- The team would like to develop this prototype into an application and conduct a pilot program in Hawai'i. After determining statewide success, collaboration with other states would be pursued to perform large scale testing, and potentially expand services across the country to combat opioid overdose in the United States.

## Limitations

- Due to time and budget constraints, naloxone independent focus groups for bystanders, naloxone carriers and opioid overdose victims were not developed.
- There are variations in current state laws and the authors were geographically based in Hawai'i, only Hawai'i state law was considered in the development of this application.

## Disclosures

Authors of this presentation have nothing to disclose in concerning of possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation.