**Welcome to our app: NOXY**

**Naloxone |  An Epi-pen is to an anaphylactic reaction as Naloxone is to an opioid overdose.**

**TEAM:**

**Kellie Quan, PharmD, BCGP |** Pharmacist

I am a clinical pharmacist serving surgical ICU patients at Ronald Reagan UCLA Medical Center and a board certified geriatric pharmacist caring for geriatric patients in skilled nursing homes. I have been working in both disciplines for 16 years.  My work in the hospital side has exposed me to treating pain in the post surgery setting where Naloxone is automatically ordered alongside epidurals and oral/IV controlled substances.  My work in the skilled nursing facilities has allowed me to see the use of opioid medications in the elderly population, following acute surgeries (i.e., rehabilitation post hip/knee replacements), injury (falls), and in chronic pain treatment. My motivation in both jobs is to educate the practitioner and the patient in the importance of safe narcotic opioid use as well as promoting efficient prescribing practices.  I feel that my role as a pharmacist has a direct impact on both the patient and the practitioner, and thus, on the current rising opioid epidemic.

**Kurt Braget**  | Entrepreneur and Programmer.

I’m the founder of Popstand Inc, one of LA’s fastest growing app development studios.  I started working as a programmer at my first startup in 2006 on a cutting edge secret shopping video platform.  I have been hooked ever since.  I have built 4 startups that received significant angel investments.  Over the last 12 years I have been able to work as an application programmer and an adviser for 100s of applications, including companies like Boeing, AT&T, Verizon, T-Mobile, and Fidelity.  I studied Computer Science and Mandarin Chinese as a double major in Portland State University.  I chose to work on this problem because in 2015 my uncle Danny passed away due to an opioid related overdose. It has been very devastating for my family, especially my aunt who could have helped him if only she knew how.

**Adnan Inayat** | Lead Designer

I am the Lead Designer of Popstand Inc. I first started designing mobile apps for worldwide competitions for fun as a teenager. I have designed and helped build dozens of applications over the past three years. Some people have called me a young Jony Ive, because every project I work on I obsess over every detail, until it is perfect.  I am also a specialist in video editing, production, and photography. I have a Masters Degree in Arts from Iqra University.

**NOXY App concept:**

Our mission is to build an app that *every* patient prescribed an opioid will use.  We want to drive the use of this app at the point of prescription refill pickup at retail pharmacies (CVS, Walgreens) AND when doctors prescribe the opioid medications.  Pharmacies may supplement the opioid prescription with a brochure detailing our app, NOXY which also includes a Naloxone info sheet.  The brochure also includes different Naloxone formulations (nasal spray, auto-injector, or injection) and where the patient can obtain Naloxone.  Pharmacists will counsel patients on their opioid prescription and encourage download of NOXY.  NOXY will walk them through the side effects of overdose and the importance of obtaining naloxone.

Our solution to the opioid overdose problem is coming from a preventative standpoint.  By implementing the above, all patients will have downloaded NOXY when they pick up their opioid medications, BEFORE the accidental overdose occurs.  The pharmacist, prescribing practitioner, and the app NOXY are three points of intervention serving as a ‘reminder’ to obtain Naloxone. Having Naloxone on hand is what will save lives, not an app.  NOXY acts as the conduit to increase Naloxone education, mandate Naloxone brochure handouts at pharmacies when patients pick up their medications, and change prescribing patterns at MD offices whereby physicians (or practitioners) will write for a Naloxone prescription along with every opioid prescription (or encourage naloxone purchase if states do not require prescription).

**The Epi-pen: Learn From What Already Works**

A great example of life saving, time critical medicines is an Epi-pen. An Epi-pen could save a patient in a dangerous allergy situation, and Naloxone could save a patient in a dangerous overdose situation. An allergic reaction and an overdose have a lot more in common than people think: both happen unexpectedly, are life threatening, and most importantly can be easily counteracted if the right medication ***is on hand****.* The most effective way to save overdose victims’ lives is to prescribe Naloxone to opioid consumers.

“ An estimated 3.6 million Americans were prescribed an Epi-Pen in 2015, as reported by the [*Wall Street Journal*](http://www.wsj.com/articles/mylan-faces-scrutiny-over-epipen-price-increases-1472074823). According to the [Food Allergy Research and Education](http://www.foodallergy.org/facts-and-stats), the Center for Disease Control reported that more than 300,000 ambulatory-care visits occur per year for children under the age of 18 because of food allergies.”

**What Won’t Work**

Expecting human behavior to change overnight or even over a couple years can be a terrible mistake in apps.

For example, if you are in a life threatening overdose situation, why would you need a panic button in an app? In this situation, if you do not have Naloxone, you should call 9-1-1. Apps might seem cool and savvy from a technology point of view, but if your mom was about to die from an overdose, trust me, you will call 9-1-1 or wonder why you didn’t listen to us and have Naloxone in your medicine cabinet.

Let’s get back to our analogy of the Epi-pen, imagine what would happen to the 3.6 million Epi-pen users if they relied on an app for an anaphylactic reaction.  I know, because I almost died from an allergic reaction.  If somebody suggested I press a panic button to save my life I would have told them they are insane.

Another example of what will end your life is relying on an application to source Naloxone from a local network. This is a common error in applications that is related to something called a “Network Effect”. This means an app’s value is directly tied to the number of people who use it. In this situation, I’m putting my life into the hands of a weak network, and this will likely get app developer sued into bankruptcy.  Imagine signing up for a Naloxone app that 1,000 people are using, and you rely on somebody. This is virtual suicide.

Another limitation is that not many people have Naloxone.  Period.  It is a huge misconception that a many lay people have Naloxone sitting in their medicine cabinet.  Save for a few first responders and substance abuse addiction programs which have handed out overdose kits to the general public, there are just not enough people who have Naloxone to have a reliable database from which to go to in an emergency overdose situation.  This ties into the above explained “network effect”:  a weak network in addition to very small number of people carrying Naloxone makes for a weak app.

If we are trying to save lives and not win the Darwin awards, we need to get rid of the notion of apps saving people in time sensitive, life threatening situations. Sure, maybe it will work in the future (when *everyone* has Naloxone), but we would rather save lives NOW.

Let’s summarize. Panic Button: *dead*.  Local Naloxone network: *dead.*

**Where This Is Proven To Work**

Hospitals are the greatest example of where having Naloxone on hand will save overdose victims’ life.  For every controlled substance, high-dose, narcotic opioid medication ordered, Naloxone is automatically ordered alongside it in an order set.  Thus, a patient has Naloxone in their medication profile for *when* and *if* a patient ever exhibits overdose symptoms, the nurse can automatically administer Naloxone to the patient. Of course this is in an acute hospital setting but scaled to a community setting, it is no different.  Our goal is to have Naloxone in every patient’s hands, similar to the Epi-pen.

**NOXY app target audience:**

NOXY can link with the CURES 2.0 database and reach every opioid user to educate them on the importance of having Naloxone in their possession.

* Chronic opioid users:  A database of all prescription opioid users in the state of California. CURES 2.0 (**C**ontrolled Substance **U**tilization **R**eview and **E**valuation **S**ystem) is a current database of all Schedule II, III and IV controlled substance prescriptions dispensed in California serving the public health, regulatory oversight agencies, and law enforcement. CURES 2.0 is committed to the reduction of prescription drug abuse and diversion. CURES 2.0 keeps track of current prescriptions and past history across all pharmacies and prevents ‘doctor shopping’. Many states have implemented a prescription drug monitoring program such as CURES 2.0 in California.
* Family/loved ones of the above opioid users.
* Convicts leaving prison
* Drug abuse clinics/treatment programs
* Heroin users

**NOXY app technical overview:**

Noxy works on iOS and Android. The app is written in React Native, a cross platform mobile application framework built by Facebook. It will be live on the App Store first, then on Android Play Store. We will choose this to reduce development across two platforms; we would only need one code base for both Android and iOS if using React Native. The core language is Javascript in ECMA 6. This allows for very clean object oriented code that is well organized and easy to read. The backend uses Ruby on Rails.  Database is MySQL. The app consumes data from local Naloxone providers and connects to Google Places API to source the place information. The mobile client uses a storybook structure which is implemented in a Scrollable Tab View. The point is to guide and educate them through what Naloxone is, why they should get it, and where they can acquire it. The app urges the user to share, which would use the local text message function on the phone to send a share link to loved ones or other people who want to help. Cures 2.0, a thorough database of all opioid prescriptions is also used to source all patients on an opioid who could benefit from carrying Naloxone.