

Some of the earliest memories of my older brother, Chris, were of him in a hospital bed hooked up to a nebulizer, an apparatus that delivers a mist of asthma medication to a patient as they breathe. Asthma runs in my family; my brother was constantly in and out of the hospital for severe asthma attacks, and in 1997, my grandfather died due to complications related to asthma. My parents were very strict about not having pets and making sure that no one in the household smoked cigarettes when I was growing up. My brother stayed indoors and played video games instead to avoid the many asthma triggers outside. I was taught at a young age what to do when I saw my brother struggling to breathe. My mom showed me how to measure out medication into my brother's home nebulizer and how to help him during an attack. I did not envy my brother's condition; his life seemed so limited.

When I was in the 1st grade, I was diagnosed with asthma after an unexpected asthma attack. My parents knew exactly what to do during my attack and rushed me to the emergency room. Recounting the incident, they claim that I was frantic and scared of what was happening, although I have no memories of the attack. After my diagnosis, my daily routine changed. Before recess, any student with a medical condition had to report to the nurse's office. For kids with asthma, this meant recording peak flows and taking medication. A peak flow measures a patient's lung capacity and is a good indicator of asthma symptoms. Each student had their own mouthpiece with their name written on it. The nurse would always remind me not to take my brother's mouthpiece, the only other one with Sayo on it. My brother helped me set up my peak flow journal and instructed me to carefully plot my peak flow results— he knew that my penmanship was not the best. That journal became a staple of my childhood; it was shuffled constantly between my doctor and the school nurses.

These early habits of managing my asthma made me incredibly careful in my adult life about my condition. My asthma had been fairly dormant throughout my teenage years despite an active lifestyle and an occasional cigarette. During the winter of 2011, I had an asthma attack for the first time in many years. The experience was scary and even though I could recite to my doctor how to deal with an attack, it was difficult to follow those directions throughout the two days of my asthma episode. The attack was not sudden; in fact, I thought that I was just having really bad allergies. But, as I went through my symptoms, I quickly realized that I needed to start my medications immediately.

The episode was an eye-opener. I was three months shy of my 23rd birthday, which was the exact date that I would be uninsured. If I had the attack in April instead of December, I could have landed in the emergency room with an expensive medical bill. The episode made me

realize that no matter how knowledgeable and prepared an individual is, asthma attacks can happen and can be very stressful if they catch you by surprise

This experience solidified my thesis topic and made me want to explore what I could do as a designer to affect change in the realm of asthma management. I began my research by talking with members of the Greater Baltimore Asthma Alliance (GBAA). The organization is comprised of health care providers, community health workers and public policy experts working around the issue of asthma in Baltimore. Their most pressing need at the time was work on their asthma action plans. Asthma action plans also known as asthma management plans are documents used by doctors to easily explain a patient's treatment plan. They prescribe certain medications for symptoms that a patient may be feeling. The plans use a stop light system: medications in the green zone should be taken daily even when the patient feels no symptoms, yellow zone medications for when certain symptoms occur and the red zone medications are to be taken only in the event of an emergency. The Center for Disease Control suggests that all individuals with asthma have asthma action plans to follow. Using these plans helps a patient know exactly what to do when their asthma symptoms flare up. GBAA and the Maryland Department of Health and Mental Hygiene (MDHMH), were finalizing a much-needed redesign of their action plans but with one minor problem. These experts in the medical field did not have a designer to help with the redesign. They were following a template from past years and jamming as much information as they could on these plans. I worked closely with the MDHMH to understand how they approached the action plans as a design problem and made recommendations about how to update it.

After working with the health department on their action plans, I wanted to find a way to incorporate what I learned from them about best practices into a digital tool for asthmatic patients. The design challenge for me was translating an analog tool into a digital experience. The bulk of my thesis work has been working on the app, Breathe Easy. It allows a patient to record their daily symptoms and medications. The patient can also keep track of their peak flow records and monitor trends in their peak flow performance. Keeping a regular record of asthma symptoms helps doctors determine the most concise and affordable treatment plans for their patients. The aesthetics of Breathe Easy are light and airy. Similar apps on the market look and feel very heavy. They use dark colors and outdated button styles and have very little updates from their developers, leaving users with bug-ridden versions of a potentially useful app. Currently, the app is in its early stages of development and needs more input from users. Developing a mobile app for a condition that disproportionately affects lower-income individuals might seem counter-intuitive. But, smartphones and tablets are becoming more affordable and pay-as-you-go models for data payments are becoming widely available. Google Play, the

marketplace for Android OS, has over 10 asthma apps while Apple's App store has 4 apps that help a patient manage their asthma.

The biggest point of difference for my work is user interaction and the branding of the product. Creating an approachable and simple interface was very important and I'm interested to see how that interface evolves as I test it on users in the future. My goal is to see the app developed and brought to the market in the coming months. I look forward to that journey.