

# Usability Test Review

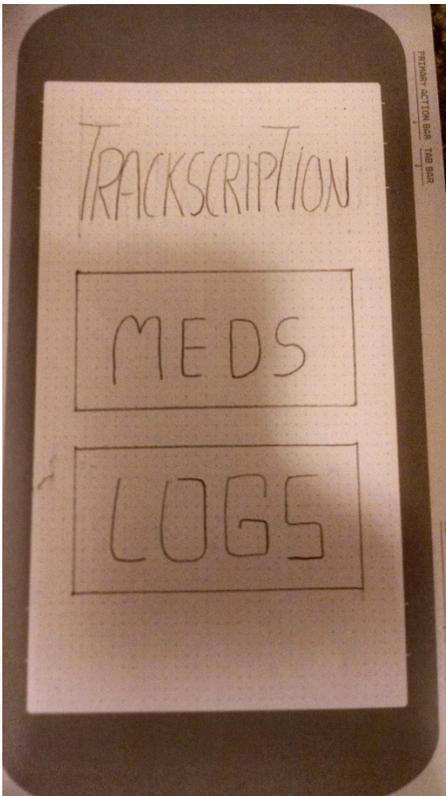
*Final Revisions to  
Paper Prototype*

## Usability Tests

- Our first usability test was done with a female UW Student at a computer lab on campus named Rama. We chose this participant because they are familiar with technology and we were mainly looking for logic issues in our use flows of the application. David gave the context and ran the application as Jorge and Svetlana observed and asked questions at the end of the usability test.
- Our participant was named Chaz, a male UW student we tested at Mary Gates. We chose this participant because he is available and willing to help us. David and Jorge introduced the user to the product, gave them their tasks, and asked questions at the end, Zoe was the 'computer' and took notes. We made some slight changes after this test, by adding an automatic countdown on our emergency response screen and putting more info on the smart capsule.
- Our last participant was named Jen, a female UW student we tested at Mary Gates; we chose her because she was willing to help us. Like previous, David and Jorge introduced the product and gave tasks while Zoe was computer and note taker.

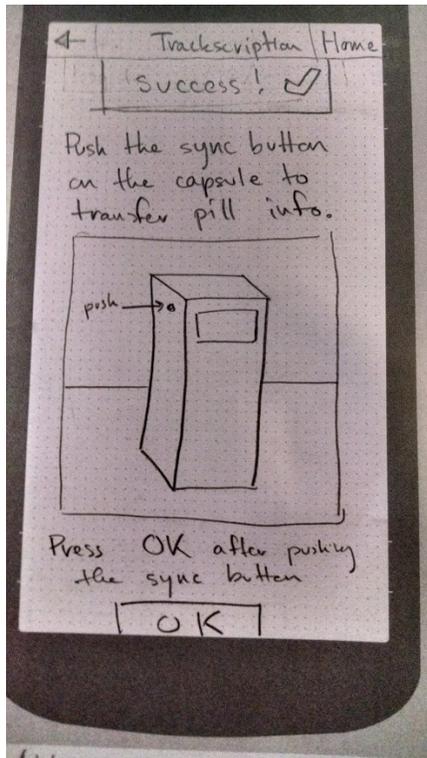
## Results

### Home Page change



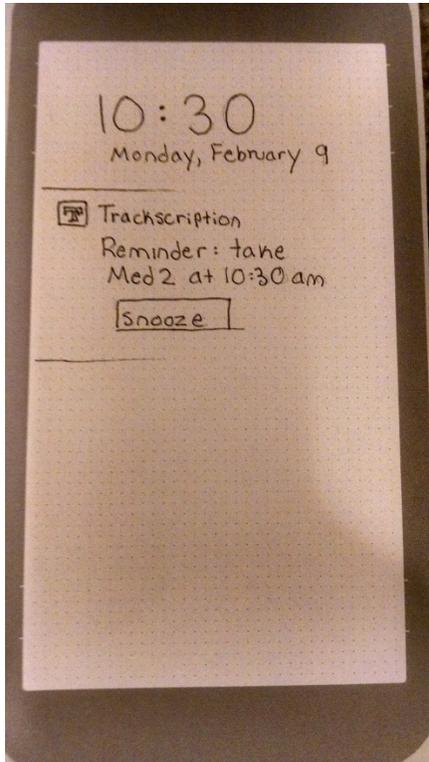
- Users had trouble understanding what "Meds" and "Log" meant and expressed confusion about how to add a medicine.
- This was relatively severe as each participant got stuck on this first step and took some time trying to figure it out.
- We renamed the buttons to be more clear and added a new "new medication button" for fast and easy usage. (new image)

### Syncing the Pill Bottle



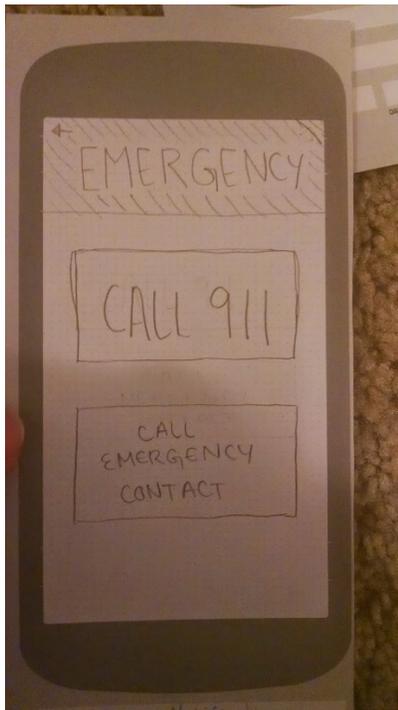
- The sync process was long and confusing before, and people would try to pour medicine into the smart capsule directly without following our instructions.
- This was severe as they went out of order and it made our control flow even more confusing and it was hard for the user to know what to do.
- We streamlined this by eliminating syncing entirely. We instead tell the user to pour in the pill which will automatically start the syncing process. From there they can scan the QR code and continue like before. We added a notification telling them that pills were added successfully, and removed a "Done" button that users kept trying to press before they actually completed any action.

### Notification Interaction Revamp



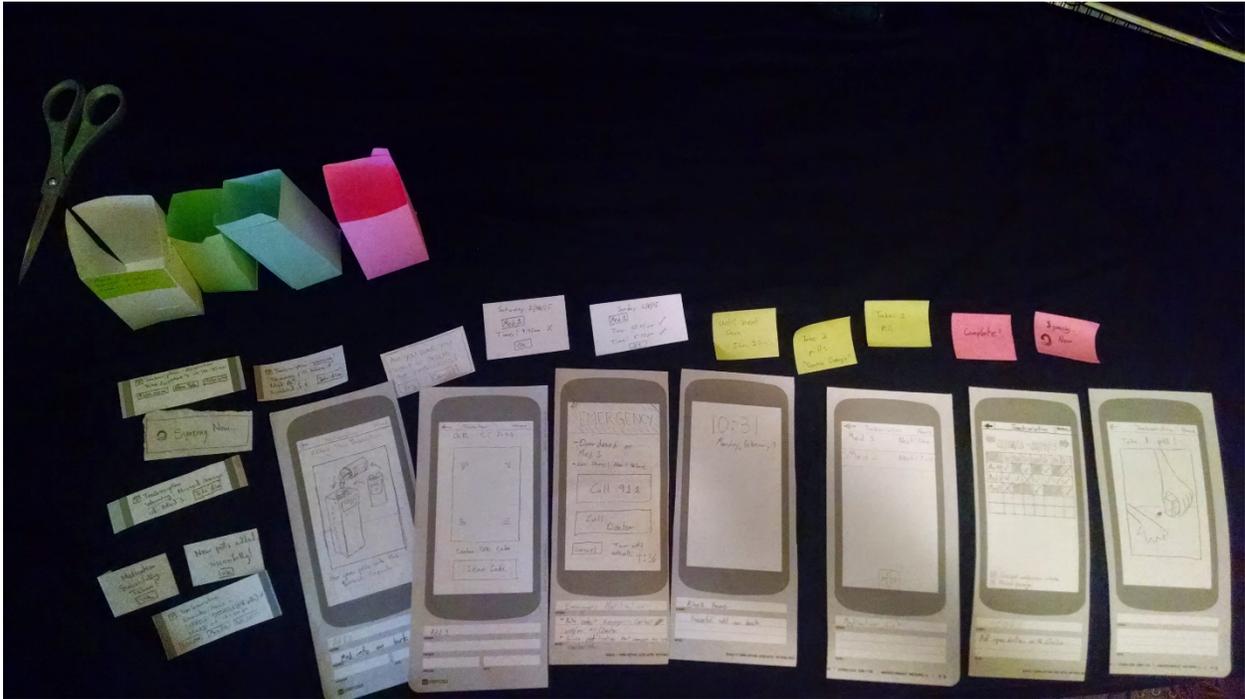
- When getting a notification about taking medicine, forgetting to take medicine, taking too much, etc... Users felt confused about how to interact with it; if they should swipe it away, click 'snooze', what 'snooze' meant, how much medicine to take and more.
- This was a severe problem because more than one user expressed confusion about what they should do about the notification and got very stuck, one time hitting snooze over and over and never taking the pills.
- To fix this, we standardized a 3 option interaction on each notification that listed options, see below. If the user clicked 'Take now' they will get a screen telling them to plainly take their medicine along with a visual aid. A success message will appear if they take the correct amount.

### Emergency Procedure

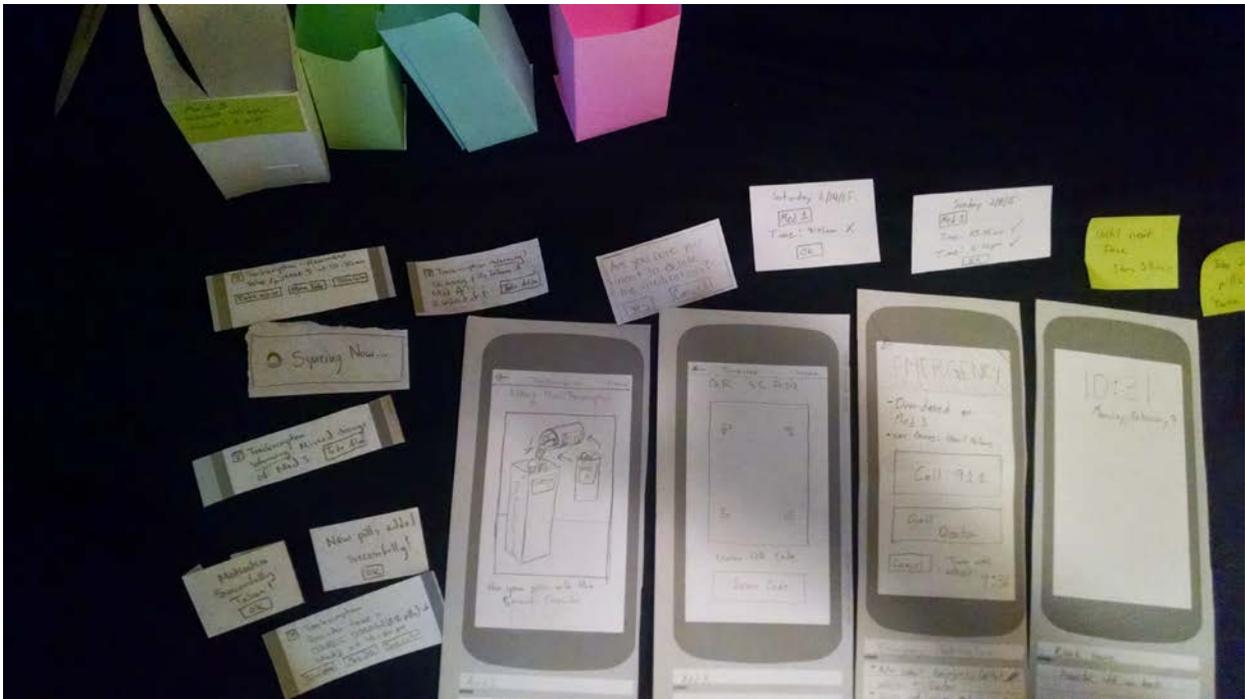


- The user expressed concern that if they got to this page, they would want to know why they should call 911. They were not convinced they should necessarily trust the app and wanted to have an option to call a doctor as a less drastic response. Also, they pointed out that if they were seriously in danger it could be to the extent that they wouldn't be interacting with their phone, or hitting the buttons.
- This was less severe than previous issues because the user could still navigate these pages and understand what to do, and only wanted some extra functionality.
- To fix this we made a few changes. Emergency contact got replaced because if this were an emergency, your contact would have to call a doctor or 911 so it seemed redundant. Next we added info about why this was an emergency and they should act. Next, we made an automatic countdown time that will start when the user is officially late to take their vital medicine. If the user doesn't take their medicine or get to this screen and cancel this countdown, the app will call 911 on behalf of the user, providing their location. Lastly, if the user sets up an emergency contact, that user will get a text message notifying them that this user has missed a vital medicine and may be in danger.

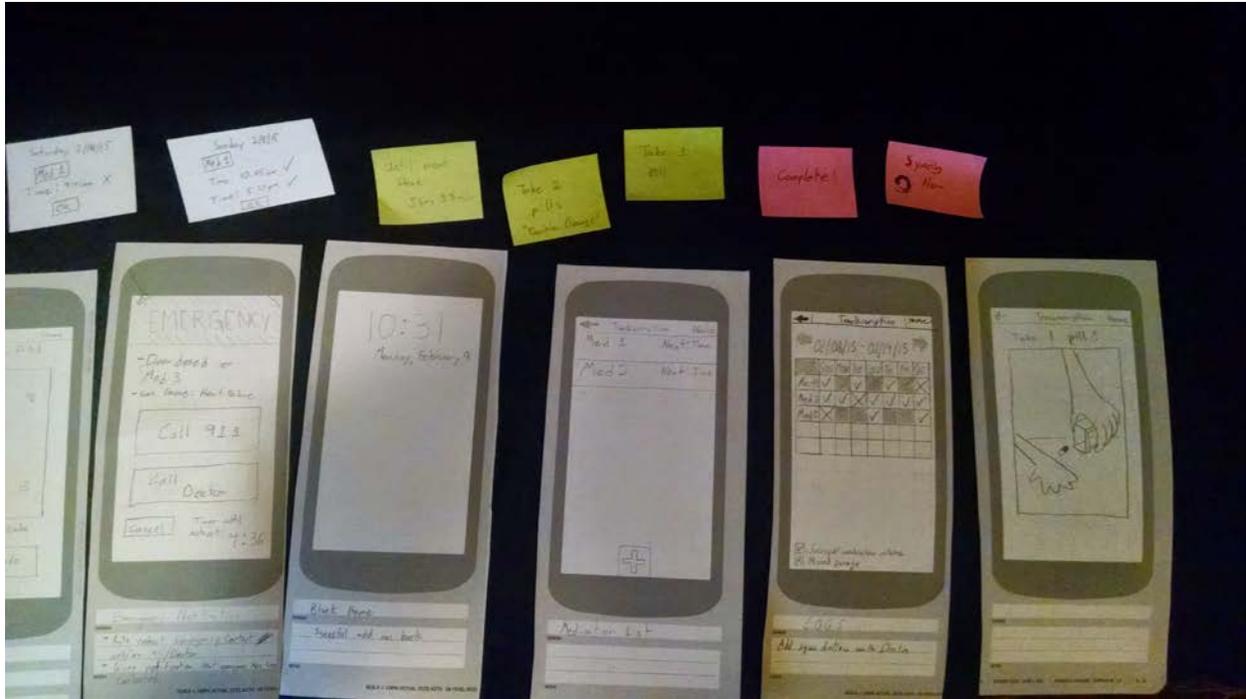
## Overview



Whole view of prototype



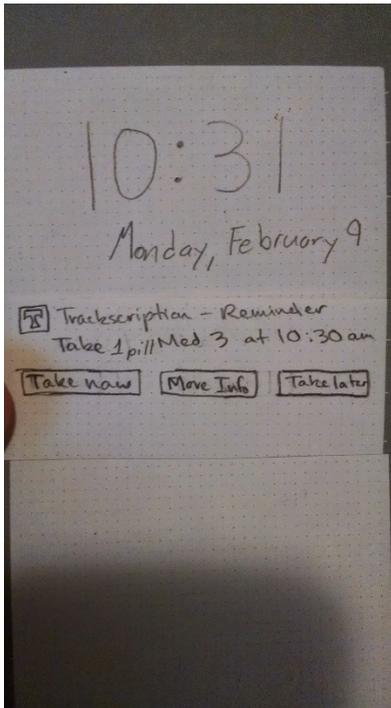
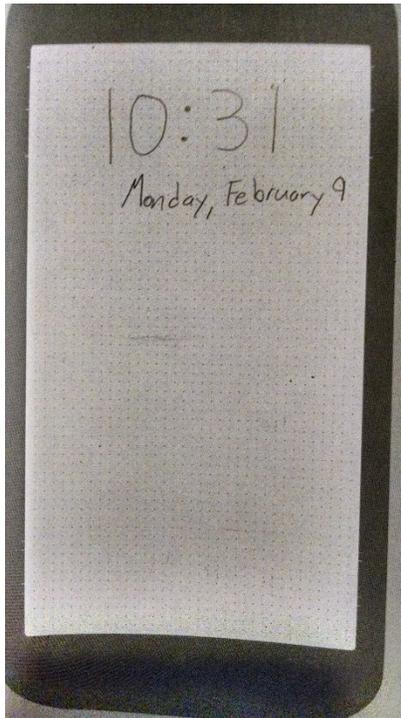
Closer image of modals and screen sets



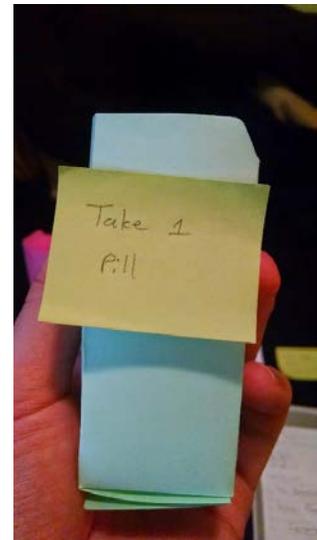
Another set of modals and more screen sets

### Task 1: Reminder to Take Medication

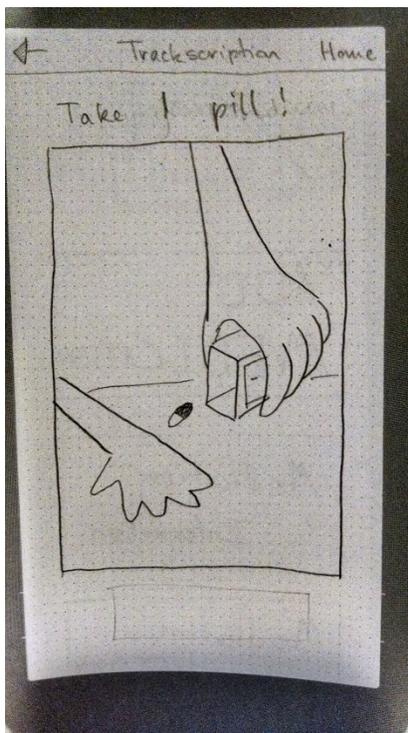
- User gets a notification on their phone to take medication. (far left)



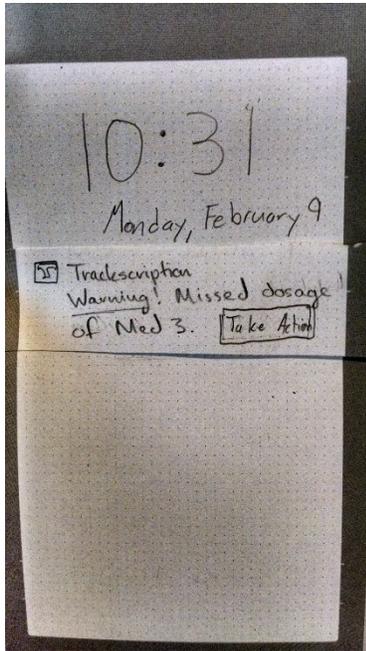
- Notification gives user several options to take for medication. (left)
- Smart Capsule also lights up green and screen let's user know how many pills to take (below)



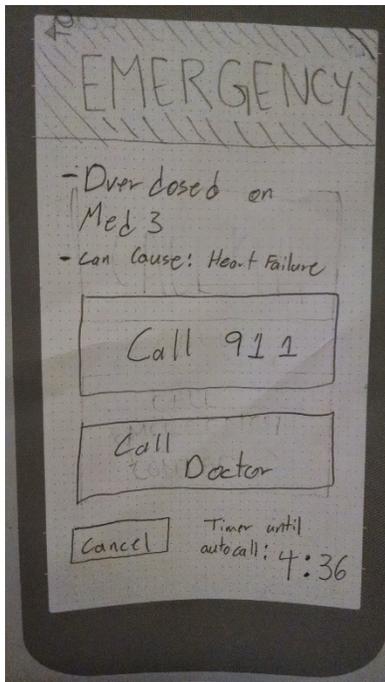
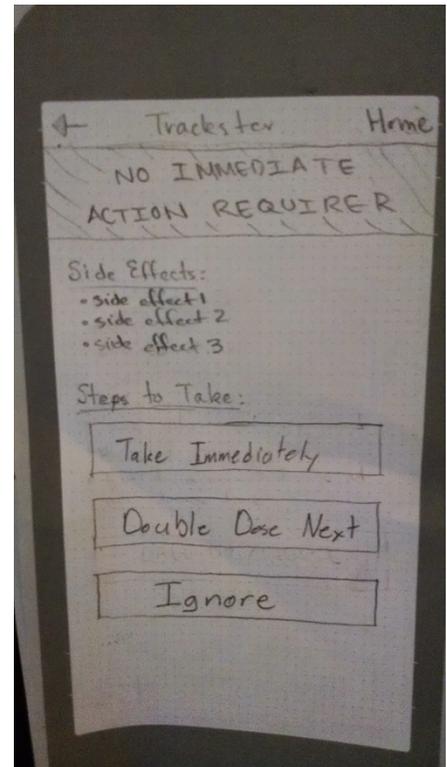
- When users decides to take the medication this screen is shown. (Left)
- After medication is taken users gets a modal confirming that they have successfully taken the medication and also takes them back to home screen. (Right)



## Task 2: Handling Missed or Wrong Amount of Medication Cases

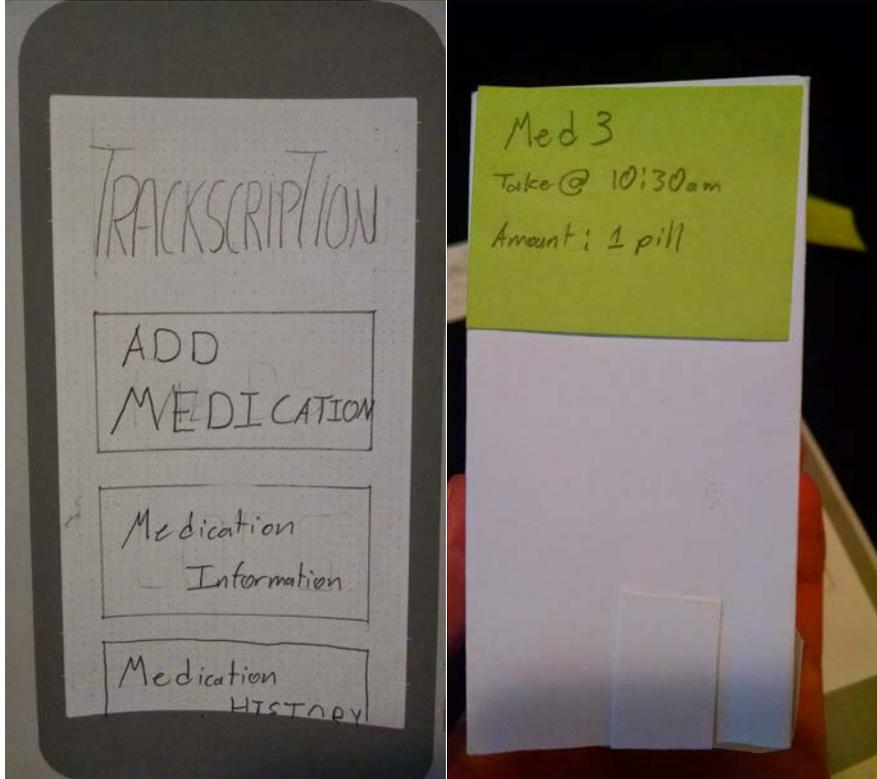


- User gets a notification saying that they missed their medication and a call to take action. (Left)
- Upon clicking on the notification or the button they are taken to the next screen where they are present with more information and course of action they can take. (Right)



- In more vital situations users will be presented with this screen instead of the more passive screen above. This is dependent on the severity of the medication consequences that they have an error with. (Left)

## Revised Screens



The home screen and pill box also got some revisions to help with user interactions for more intuitive uses.

## Revisions

There were 4 major changes and revisions to our design, product of the inspection, critique, and posterior user tests. These changes are grouped into 4 categories that identify the core design concept being changed. Each of these changes also prompted further minor changes in our design. Below are the 4 core modifications to our paper prototype.

### Smart Pill Box

The first major revision to our prototype involves expanding the functionality of our smart pill box. Initially, the smart pill box was able to send medication reminders to the user through color signals. No other information was relayed to the user through the smart pill box. During our critique and user tests, it was very clear that interacting with the smart pill box was significantly easier than interacting with the phone app. Therefore we decided to move some of the functionality of the phone app to the smart pill box when possible. From the critique and first user test, we decided to add the possibility of introducing a new medication into the app system by simply dropping the pills into the box. This simplifies the act of adding a new medication and only requires scanning QR code from the pill capsule afterwards. From the second and third user tests, we decided to add more feedback to the user using the smart pill box. The smart pill box not only sends a color signal prompting for an user action, but it also displays the current medication being managed by the box,

and the next scheduled intake of the medication. This allows for the user to plan the next intake without needing to rely on the phone application. All these changes aim at easing the process of managing medications, and are especially important when considering our focus group, non-tech savvy elder patients currently taking multiple medications.

### **Home Screen**

The second major revision to our prototype also aims at simplifying the process of introducing a new medication into the system using the phone app. During all our user tests, the user struggled to initiate this task. It simply was not clear enough how to initiate the process of introducing a new medication into the system. Direct feedback from the second user gave us the idea of adding a new button to the home screen. This new button labeled “add medication” fully resolved this issue. This also prompted a change in the other buttons from the app home screen. Our old “meds” button was split in “add medication” and “medication info”. The “log” button was also replaced by a “medication history button”. These changes removed all the existing ambiguity of the home screen. With the new changes, the process of initiating a new task through our phone app becomes more clear and intuitive.

### **Synching**

Our initial design required using a sync button located in the smart pill box when introducing a new medication into the system. This was done in order to prevent foreseeable user errors when handling the smart pill box. However, from our critique and posterior user tests, it became more and more clear that our main goal during the design of the app was to simplify and ease all the interaction with our design. This involved fully dropping the sync button, and instead aim for a design that allows for error detection. There is currently no need to sync the box with the phone app manually. Instead, it is the box that initiates the syncing once pills have been added into the box. We have also worked on the logic behind the error detection. Some of the errors our smart box will handle involve pouring out all the medication from the box, adding medication to the wrong box, etc... All these edge cases will be handled using the pressure or weight sensor and a notification system.

### **Visual notifications**

The last major revision to our prototype involved changing the way we provide feedback to our users. We have eliminated all the transition screens that were not absolutely necessary in order to perform a task. We noticed we were providing too much medication info when this was not specifically requested. This was confusing some of our users when trying to perform a task. We have also put more strength on visual feedback. We now show an image on the phone when introducing a new medication or when taking a new medication that shows how this process is done using the smart pill box. This screen can be cleared once the user follows the on screen visual instructions. This is done to prevent some users from mindlessly clicking buttons to move on through screens. The medication reminders sent to the users are also more clear and descriptive. We removed our general notification message followed by a detailed medication info screen for a simple medication reminder that display the amount, the time and the name of the medication to be taken. This is also done when handling missed medications and overdoses. As described during the first core design change “smart pill box”, we are also providing feedback to the user through the

smart pill box. This removes the need of using the app for taking medications. The phone app becomes a tool to expand the functionality of the smart pill box, not a mandatory interface.