Problem

After surgery, patients are often given a generous prescription for powerful yet addictive opioid-based analgesics (painkillers). Unlike the experience in a controlled hospital environment, at home, patients are suddenly faced with the need to regulate their own pain medication while they recover.

The combination of over-prescription, ineffective self-regulation, and a lack of awareness of drug return practices has resulted in an opioid crisis that has claimed more than 42,000 deaths and two million cases of opioid abuse in 2016 alone.

Design Question

How can we support and improve mindful and data-informed post-operative pain management to maximize patient comfort while also deterring the abuse of opioid medication?

Concept

Recap is an easy-to-use self-medication device prescribed to individuals with an opioid prescription after a surgery. Personalized for the individual, Recap gently steps patients towards lower or less-frequent opioid dosages during recovery. The device also provides caregivers with usage data, and is returned to the pharmacy once it is no longer needed.

Timeline

1. Research
The team conducted extensive research to further understand both user and stakeholder needs for the product. This research included reviewing scientific literature, conducting user interviews, and analyzing potential market competitors.

2. Prototyping
The design phase began by prototyping early concepts for the interface, internal mechanisms, and overall form factor. These initial visions for the device helped to prepare designs for rigorous iteration and user testing.

3. Iteration
The team developed physical proof of concept for the device form factor, dispensing engineering, and digital interface. With these early prototypes, usability tests were performed with ten participants of a wide range of ages (20–75) and backgrounds, advising changes for the next phase.

4. Implementation
The final prototype is a fully-functional device that dispenses pills as requested and tracks pain level inputs by users via LCD touch screen. This milestone features a system report laying out the functionality and design intent at the core of the device to aid in future work.