

EpiPen Case Study

My improved design for the EpiPen primarily aims to solve the problem of accidental needle prick injuries, but it also will help improve safety and reduce medication waste due to misfire. This solution comes in two parts: improved EpiPen design and an app. Numbers correspond to diagram.

1. Moulded Grip

To encourage proper grip of the EpiPen, the plastic barrel of the EpiPen is moulded to contour fingers. This design is easy to understand by untrained individuals since it is quite common in other products. Having a designated place to place fingers will help keep hands away from the needle end, reducing needle prick injuries. The EpiPen is already injection moulded, the contoured design will also be made this way.

2. Button Safety Release

The springing mechanism of the EpiPen is not changed due to its simplicity. However, the safety release mechanism will differ. Instead of removing a blue cap, a blue button must be depressed during drug administration. There is a plastic arch above the button to eliminate accidental presses.

Along with the moulded grip, the button makes sure that the person administering the EpiPen has their hand out of the way of the needle end.

The button can be un-pressed, which re-locks the injection mechanism. This prevents waste of a useable EpiPen if accidental depression occurs.

Finally, the button is coloured blue to integrate it with past First Aid training. The training instructs "Blue to Sky, Orange to Thigh," keeping blue on top will cause less confusion during conversion to this new design.

3. Larger Instructions & Moved Medical Information

On the original EpiPen, the instructions are very small, and much of the space on the device is taken up by required medical information. In my design, the medical information is moved to the EpiPen's carry case, which allows for greater area for instructions. Also, vital instructions such as "Hold for 10 seconds" are given more prominence. This would allow untrained users to better understand how to administer the medication. The instructions would be printed on a sticker and applied to the plastic.

4. Sound Instructions

To make sure instructions are understood, a speaker and battery are implemented in this design. When the blue button is depressed, the speaker is activated. It says a slightly more detailed version of the instructions. The sound will come from a small speaker placed on the back of the device. This will increase the compliance to instructions and decrease injury.

5. Battery Life linked with Drug Expiration

The battery will have a lifetime of 18 months, the same length of time as the drug expiry. By showing the amount of battery life left, the expiration of the drug will also be known. An indicator will be shown on the device showing how many months are left. The battery can be placed in the extra space the moulded grip creates within the device.

6. Barcode and App Tracking System

There will be an app accompanying the improved EpiPen. Each device will have a unique barcode that can be scanned into the app, which will automatically know that device's packaging date and thus its expiration date. The app can notify a user when there is one month left on their smartphone. The app can link with the phone's Health app to allow allergies to be viewed without unlocking the phone.

The app will also track the use (or misuse) of each device. To gain more insights on how EpiPen accidents happen, the app will ask the user a series of questions to understand if and how mistakes happen. Using this information, more updates to the EpiPen can be made to improve safety.

Diagrams

Not to scale. See description above for each annotation.



6. App Mockups

To see this app in action, see video: <https://youtu.be/2FGedA96aTw>

