

Anti-Phylax Pen

Group 2:

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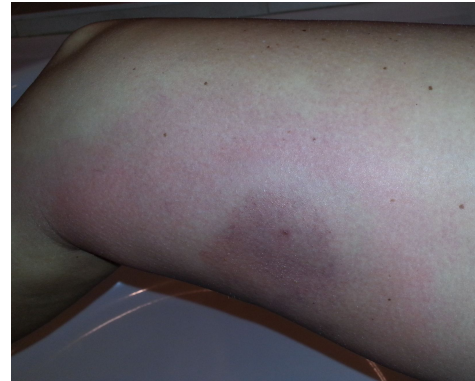
Background



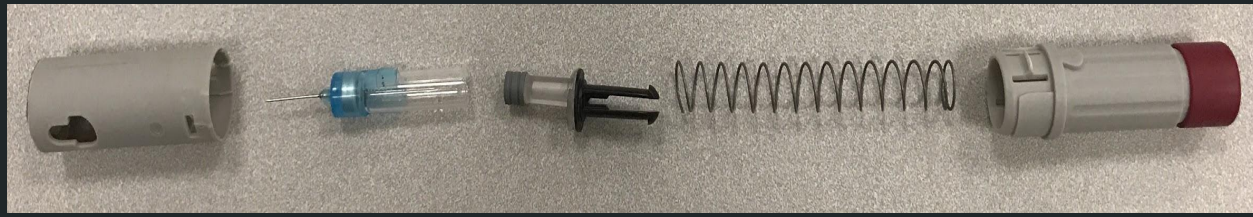
- Severe allergic reactions, also known as anaphylaxis, can be life-threatening.
- EpiPen, an epinephrine auto-injector, is commonly used to treat anaphylaxis.
- Mylan, the company that makes EpiPens, claimed to invest billions in the product, while they edged over their profit estimates

Problems

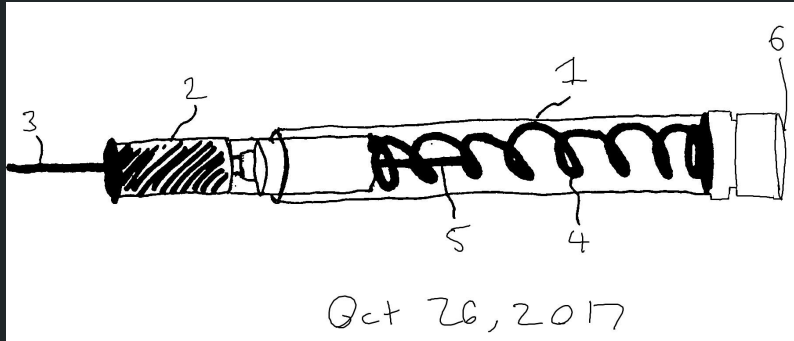
- Activating the auto-injection mechanism requires great amounts of force and causes bruising
- Costs: A 2-pack EpiPen is around \$600
- Size: Almost 6 inches in length and an inch in diameter
 - 3.6 million people were prescribed EpiPens in 2015 for allergic reactions yet 60% of people do not carry it due to its size and weight
- 300,000 people under the age of 18 are sent to the hospital for anaphylaxis without epinephrine every year



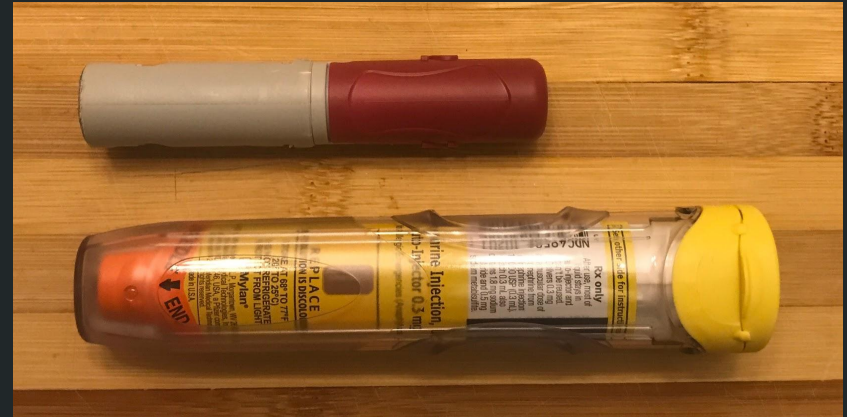
Solution



- The Anti-Phylax Pen is a device aimed to treat anaphylaxis by a button-injection of epinephrine into the human body. The Anti-Phylax presents a more affordable, portable, and safe alternative to EpiPens.
- The button-injection system is also accompanied with a touch activated timer that emits a red light for 10 seconds and then turns off to indicate completion to the user of the Anti-Phylax



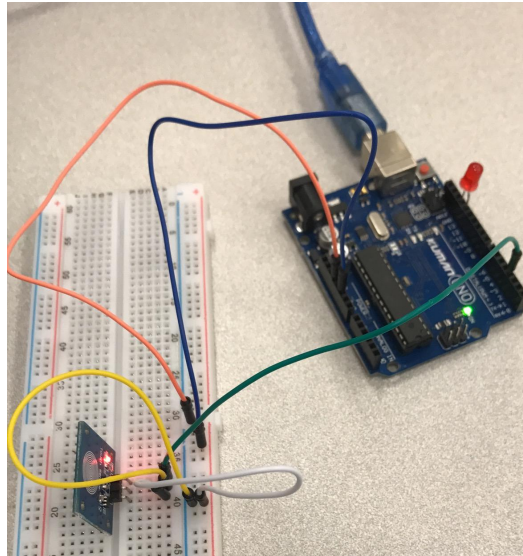
(1) Plastic casing (2) syringe (3) needle (4) spring (5) plunger (6) button & safety cap



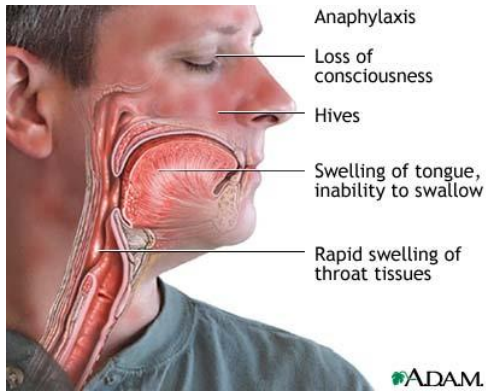
Prototype

- Button-injector replaces auto-injector to prevent bruising
- Touch sensor (wired to the Arduino) attached to the button on the pen, turns on the LED for 10 seconds, and turns off when injection is complete

```
led_blink$  
#define TOUCH_SENSOR 3 //touch sensor is connected to D3  
int led = 13; // pin for the LED  
  
void setup()  
{  
  pinMode(led, OUTPUT);  
  pinMode(TOUCH_SENSOR, INPUT);  
}  
  
void loop()  
{  
  int sensorValue = digitalRead(TOUCH_SENSOR);  
  if(sensorValue)  
  {  
    digitalWrite(led,HIGH);  
    delay(1000 * 6);           // wait for six seconds  
    digitalWrite(led, LOW);   // turn the LED off by making the voltage LOW  
    delay(1000);  
  }  
  while(digitalRead(TOUCH_SENSOR) == HIGH);  
  digitalWrite(led, LOW);  
}
```



Trial	Duration of Injection (s)
1	9.05
2	9.64
3	8.68
4	9.32
5	8.97



Market



- Target customer: People who suffer from severe allergic reactions or anaphylaxis
 - Target market: Pharmaceutical companies, doctors, hospitals, etc.
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Future Work

- Reducing the size of our prototype even more
 - Custom designing syringe to reduce size
- With more resources and a larger budget, we would be able to add more features
 - Ability to reload doses of epinephrine to minimize consumer costs
- Adding safety label and instruction guide
- The Food and Drug Administration (FDA) approval



Demonstration

Questions?

References

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