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Improving the Inhaler

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Project Title: Improving the Inhaler

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Background: It is estimated that about 1 in 10 Americans use inhalers to deliver inhaled drugs for respiratory disease such as COPD and asthma. Some studies have shown that up to 84% of people use their inhaler incorrectly, which can cause long term problems and acute flareups. Therefore, improving the inhaler design to allow for ease of use was the main focus of our project.

Methods: We had a discussion with a pulmonary critical care attending who provided information on proper patient inhaler use and common user errors. He also gave us a sample of different inhalers on the market in order to examine what some other problems may be and the best way to update the design. We also plan to interview more patients who use inhalers to find other concerns and gather more data.

Results: The most common error that we encountered was patients dispensing the drug after they had already inhaled completely. Dispensing at full inhalation provides no lung space for the drug to go, preventing the drug from reaching the lungs. Another problem seen is the patient inhaling

too quickly, thus increasing the fraction of drug absorbed in the throat and again, not reaching the lungs (also may cause the total dosage not to be dispensed).

Conclusions: Our background research and results show that there is a major market for designing a more use friendly inhaler. The most agreed upon solution is incorporating an audible (and potentially visual) system into the inhaler, which would tell the patient when to begin inhaling and then when to press the dispense button. We could ‘gamify’ this system for children to make it a fun competition. After the prototype is complete, we will start trials.

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