

# PATENT PENDING NOVELTY MEDICAL DEVICE

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## Problem Statement

Current injection medical device requires manual exchange of parts, creating inconvenience for users. Patients with multiple user errors including dexterity issues, vision impairment, or mobility challenges struggle with such process. Frequent exchange add cost and disrupt treatment, and the market requires seamless and long lasting system.

## Customer Background

PharmSafe, was established approximately five years ago. PharmSafe operates in the design services industry within the broader business services sector. For this project PharmSafe is focused on a medical device.



## Requirements

A comprehensive medical device for insulin delivery designed with an ergonomic form, ensuring ease of use for a broad range of users.

## Process Flow Chart

- Step 1: Define Project Scope
  - Initial meeting with client to determine the intended function of the medical device
- Step 2: Validate User Needs
  - Conduct user survey to confirm and prioritize design requirements
- Step 3: Background Research
  - Research relevant existing mechanisms and technologies
- Step 4: Develop Initial Concepts
  - Design initial prototypes
  - Present to PharmSafe for feedback
- Step 5: Refine and Finalize Design
  - Implement feedback and iterate designs
  - Repeat as needed until the final product is achieved

## Experimentation and Concepts

1. User Survey
  - We identified a strong need for a simple and reliable device. Users consistently expressed a desire for a product that is intuitive and easy to use.
2. Identified Points of Error
  - Through careful analysis of the user process, we pinpointed specific steps where mistakes were most likely to occur. These insights guided our focus on minimizing user error.
3. Clinical Requirements
  - The design had to be safe, reliable, and comfortable—especially for users with limited hand mobility, such as those with arthritis. Ease of use was a top priority across all user groups.
4. Prototyped Solutions
  - We created multiple physical prototypes using CAD software and 3D printing. These models helped us test functionality and refine our approach by identifying what worked and what didn't.
5. Design Inspiration
  - We drew inspiration from everyday objects known for their simplicity and user-friendly design. These examples helped shape our goal of delivering a product that feels familiar and easy to operate.

## Final Design

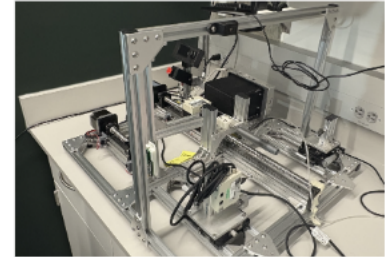
The all-in-one medical device integrates components inspired by various mechanical systems, including a box cutter and a ratchet mechanism. While the device meets most, if not all, of the company's outlined requirements, it still necessitates further refinement in design, conceptual development, and comprehensive testing by the PharmSafe team.



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## Results



National Institutes  
of Health

As a result of the team's development efforts and collaboration with PharmSafe LLC, the company was able to advance their business objectives by successfully submitting a grant proposal to the National Institutes of Health (NIH). Additionally, the design work and innovation contributed to PharmSafe's ability to file for intellectual property protection through a formal patent application, laying the groundwork for future product development and commercialization.