IV Administration Set Redesign

Overview

IV administration sets include three functional subassemblies (spike, drip chamber, and roller clamp). The current apparatus requires significant dexterity from the clinician while calibrating and maintaining the prescribed flow rate. Additionally, device manufacturing requires manual labour when combining the separate subassemblies. Our goal is to design a device that combines the function of the three subassemblies in order to streamline manufacturing processes and clinical applications.

Objectives

- Construct functional prototype that controls the flow rate comparable to the conventional setup
- Test prototypes for adequate flow control and possible sources of flow leakage

Approach

- Gathered customer input from B. Braun regarding clinical and manufacturing specifications
- Completed an external search for patents and current products related to the proposed device
- Established engineering design specifications based on customer needs and existing products
- Developed concepts with SolidWorks and discussed designs with the project sponsor
- 3D printed initial prototype
- Tested initial prototype
- Completed five iterations of prototype redesigning, printing, and testing
- Updated sponsor throughout the project with weekly memos, SOW, and DSR

Outcomes

- Overall, the team spent $97.58 on the project
- Final prototype combines the function of the 3 IV subassemblies into a single device
- Greater flow control in the final prototype compared to conventional IV systems