



The 'iPhone of Infusion Pumps' Set to Reduce Medical Errors

The Back Story

Medication errors contribute to 7,000 deaths and affect an estimated one million patients annually. To improve patient care and safety, the founders of a medical devices start-up envisioned an "iPhone of infusion pumps" that would verify the correct patient medication and administer the accurate dosage automatically.

The Strategy

The executives selected Boston Engineering to transform their idea into a working prototype. Boston Engineering applied its medical devices experience and four-phase product development process to advance patient safety:

1. *Research & Specification:* Collaborated with company executives to develop the software screens to refine the product's human factor look and feel. Also incorporated feedback from clinicians to emphasize ease of use and enhance safety safeguards.
2. *Technical Feasibility & Concept Design:* Conducted extensive "stress testing" to select a product design with the performance and reliability required to comply with FDA requirements.
3. *Engineering Design Development:* Built conceptual models and a prototype with robust features including:
 - Wireless connectivity to transmit data from the patient bedside to a central care management location, such as a nurses' station
 - An LCD touch panel to provide easy navigation, similar to a smartphone design
 - Pneumatic control that includes an innovative, "micro" peristaltic pump and meter technology
 - Redundant power supply to provide an added level performance and availability
4. *Design Verification & Validation:* Tested the product extensively. Also created and maintained design history file (DHF) documentation to fulfill FDA submission requirements.

The Impact

Boston Engineering developed a functioning prototype within four months. With this initial prototype, the company secured \$10 million in venture capital (VC) funding. The device is moving through the FDA approval process. Company executives are confident that their IV infusion pump will clear regulatory requirements and will play an important role in saving lives and enhancing care quality.