

Sponsor: St. Jude Medical, Inc.

Sponsor's General Mission or Business Statement: It is St. Jude Medical's mission to develop medical technology and services that put more control into the hands of those who treat cardiac, neurological and chronic pain patients, worldwide. St. Jude Medical is dedicated to advancing the practice of medicine by reducing risk and contributing to successful outcomes for every patient.

Sponsor's Advisors, Titles, and Phone Numbers: John Hastings, Senior Project Engineer, (952) 351-1825; Brian Swanson, Senior Project Engineer, (952) 351-1517

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Team Member Names: Nessa Johnson (ME), Brian Plourde (ME), Zach Helgeson (ME), Mike Bush (ME)

Senior Design Clinic I-II (ENGR 480-481) 2008-9 Project Mission Statement: The mission of the St. Jude Medical Senior Design Team is to design a bi-deflectable stylet which, when used in conjunction with St. Jude Medical pacing leads, is able to navigate human vasculature.

Major Design Requirements:

1. The deflectable stylet must facilitate lead placement in a heart model.
2. Use of the stylet shall not cause any damage to the lead.
3. Stylet must be capable of deforming to two distinct radii.
4. Stylet must be capable of fitting inside the inner lumen of the lead.
5. Tip deflections must be smooth and continuous across the full range of motion.

Senior Design Project Summary: This project required an engineering team with a thorough understanding of the medical device industry and its specific requirements and standards. After conceptually developing several different design concepts to achieve the desired function and curvature of the stylet, a significant amount of detailed design was performed to determine the feasibility of the different design concepts. This process allowed the team to eliminate concepts and focus efforts on two specific design concepts. With detailed design information, initial prototypes were manufactured in conjunction with vendors and the team sponsor. In addition to these initial prototypes, a DOE was performed in order to better understand the relationship between critical design variables and device performance. The use of the test findings offered the team an opportunity to analyze and optimize the system performance from a wide variety of variables. The success of the project required leadership from all group members, creativity in design concepts, a detailed and focused schedule, and skill in working with external resources.



Figure 1: Solidworks Model of Pull-Pull Concept

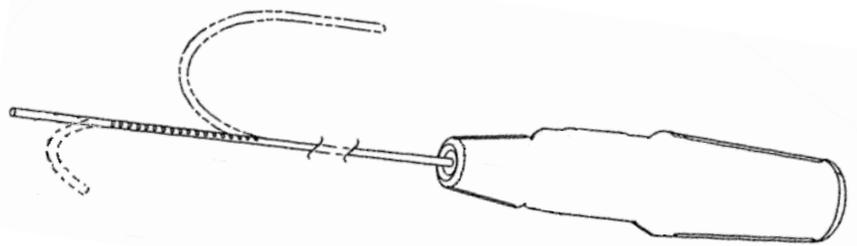


Figure 2: Depiction of Deflectable Prototype