Smart Tip LVAD Cannula for Improved LVAD Function

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Prototype device connected to an LVAD

Technology Summary

Penn State researchers have developed an advanced LVAD cannula with integrated sensors for long-term mechanical circulatory support for transplant and heart failure patients. The Smart Tip LVAD cannula incorporates conductance and pressure sensors, which permits pressure and volume adjustments unlike current continuous flow LVAD's. The Smart Tip LVAD cannula's design enables it to be easily connected to existing LVAD's, and it is sufficiently robust to facilitate streamlined blood flow while performing various tasks based on the circulatory needs of the individual during different situations. Future designs of the Smart Tip LVAD cannula will incorporate wireless power via radio frequency (RF) energy to reduce the need for unnecessary wiring.

Application & Market Utility

Current continuous flow LVADs can cause suction events leading to ventricular wall collapse, which can cause myocardial damage and dangerous ventricular arrhythmias. The Smart Tip LVAD cannula can provide volume and pressure information that can be used to control the pump. This provides superior ventricular unloading based on physiological and circulatory needs during exercise, sleep, and other activities, reducing abrupt blood flow and preventing further heart failure.

Next Steps

Seeking research collaboration and licensing opportunities.

TECHNOLOGY READINESS LEVEL 4-7

Seeking

Investment | Licensing | Research

Keywords

- LVAD
- catheter
- cannula
- circulatory
- biomedical

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