SonoSolve

Company Overview

SonoSolve aims to eliminate catheter-associated complications using a novel non-invasive method to clear obstructions and biofilms within catheters.

Problem

Catheters are used widely in medicine. Indwelling catheters may become colonized by bacteria through biofilm formation or obstructed with blood clots, proteinaceous debris, or other bodily contents requiring flushing and/or surgical replacement. Catheter-associated complications result in hospital-acquired infections, further surgical procedures, and additional time spent in the hospital or in an acute care setting. According to CDC data, catheter-associated infections alone amount to billions of dollars in healthcare spending annually. Aside from the costs, the morbidities include infections requiring antibiotics, sepsis, and even death. Furthermore, institutional quality measures and healthcare reimbursements are tied specifically to catheter-associated complications. Technologies have been developed to address these issues; however, clinical adoption has been limited due to a lack of adaptability with current standards of care. Additionally, these technologies are built into each catheter, making the cost of implementation prohibitive. Current capabilities do not include lysis of clots or proteinaceous debris. Unlike our device, existing technology can expose the patient to undesired internal effects given the application of energy throughout the catheter.

Solution

Using soundwaves, we have developed methods to agitate regions within a catheter without violating the sterility of the catheter's interior. This allows us to safely remove obstructing matter from an externally-draining catheter without having to flush it. Our device is hand-held, easy to use, external to the patient and tube system, and adaptable to a variety of externally-draining catheters. It applies energy to the lumen of the catheter housed outside of the patient and clears obstructions. These obstructions may be focal (such as with blood clots or proteinaceous debris) or diffuse (such as with bacterial biofilms). In this way, our device could be used in both acute settings and in a prophylactic manner to prevent bacterial colonization.

Founder Information

Jay Thawani, MD is a resident in Neurosurgery at the Hospital of the University of Pennsylvania and the Children's Hospital of Philadelphia. He has experience in industry and in the development and translation of novel clinical technologies.

Jared Pisapia, MD is a resident in Neurosurgery at the Hospital of the University of Pennsylvania and the Children's Hospital of Philadelphia. He has experience in translational research and clinical research protocols.

Matt Zhu, PhD is a graduate of the School of Engineering and Applied Sciences at the University of Pennsylvania with special expertise in electrical engineering.

Andrew Tsourkas, PhD is a Professor of Bioengineering at the University of Pennsylvania who has experience in device development and technology transfer.

M. Sean Grady, MD is the Charles Harrison Frazier Professor of Neurosurgery and Chairman of the Department of Neurosurgery at the University of Pennsylvania.

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