Cleveland Clinic Innovations

PRODUCT
Motion Activated System (MAS) for reducing thrombosis and biofilm in the central line

INDICATION
Therapeutic, reducing thrombosis in central line, vascular thrombosis, ICU

VALUE PROPOSITION
- Reduced thrombo-embolic.
- Reduced biofilm formation.
- Works with all catheters.

DEVELOPMENT STAGE
Preclinical model studies have been completed

INTELLECTUAL PROPERTY
Patent pending

CONTACT INFORMATION
Partha P. Paul
Director, Business Development and Licensing
(216) 672-1664
Paulp2@ccf.org

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Motion Activated System (MAS) for Functional Maintenance of Catheters

Jamshid Karimov M.D. Ph.D., Kiyotaka Fukamachi M.D. Ph.D.

UNMET NEED

Central venous catheters (CVCs) are the 2nd most used medical device after urinary catheters. More than 5 million central venous catheters are inserted every year in the US alone. However, over 15% of patients who receive these catheters have CVC complications: 2-26% with thrombotic complications, 5-19% with mechanical complications, and 5-26% with infectious complications. There is a clinical need to reduce complications caused by thrombosis and biofilm associated with CVCs.

SOLUTION

The integration of a motion-activated system (MAS) onto a standard indwelling catheter was successfully demonstrated to be effective against catheter clogging and infection-causing biofilm formation. Extensive in vitro studies have been conducted to test the concept and explore the opportunities for motor integration onto/into the existing, central venous catheter design, with an external power source. Key features of this invention include: a) minimal energy loss during transmission of vibrating energy and b) acceleration and displacement at tip of catheter that are effective against blood clotting and biofilm formation. By effectively limiting catheter clogging and biofilm formation, thrombotic complications associated with CVCs use can be significantly reduced. The concept could also be translatable to vascular applications. Overall, coagulation mechanisms are similar and can be preventable inside the vascular system and catheter by transmitting vibration to tissue in contact.

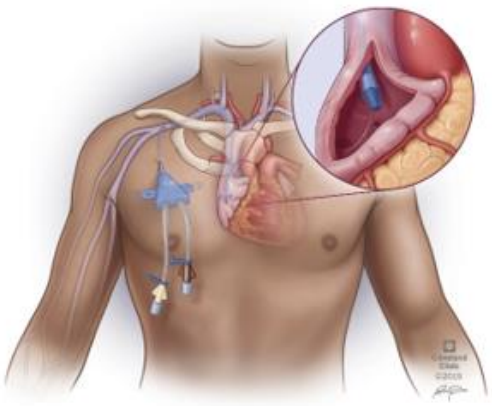

Fig. 1 Schematic illustration of the CVC in place.

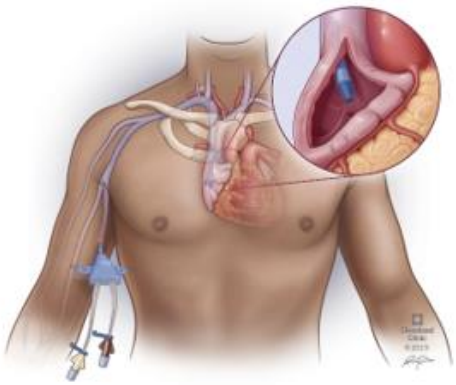

Fig. 2 Schematic illustration of the PICC line in place.