

UTILITY PATENT: Securement Device with Attachable Members

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Technology description

Unmet Need

Central lines including central venous catheters and peripherally inserted central catheters are used to intravenously deliver life-sustaining support to critically and chronically ill patients. However, the surfaces of these catheters are prone to colonization by bacteria and serve as a port for bacteria to enter and infect patients' bloodstreams. Each year, over 250,000 cases of catheter-related bloodstream infection occur in the US with a mortality rate of up to 25% (50,000 deaths), and direct costs to the healthcare system exceeding \$2 billion. Existing solutions to prevent bacterial colonization, such as the use of antibiotics or antimicrobial treatments, are threatened by the spread of antibiotic resistance and bacterial adaptations like protective biofilms. Novel solutions to combat bacterial colonies, such as using germicidal ultraviolet light and acoustic ultrasonic waves, are not inhibited by antibiotic resistance and present a promising opportunity to reduce the rate of catheter-related bloodstream infections. However, these solutions require the use of cumbersome equipment that requires additional technicians to handle and does not integrate directly onto the catheter, which complicates the clinical workflow. Hence, there is a need for a device that can secure the catheter and antibacterial equipment into one integrated unit, simplifying the clinical environment.

Technology Description

The device is a catheter securement device that can simultaneously hold a catheter in place while interchangeably attaching to a variety of active components with different purposes, including an ultrasonic wave emitter, ultraviolet light source, sensor, transmitter, and protective cover. The availability of a connection site at the catheter hub for a variety of active components (e.g., sensors, electromagnetic sources, etc.) has wide-reaching opportunities to integrate with new antibacterial techniques as they are developed. The securement device consists of a hard plastic with rounded boundaries and a snap-fit cap and ring component to hold the catheter, which is held in place by a screw-type lock. The securement base has a slight raised tab which ensures proper alignment of the catheter, and is coupled to an adhesive member that attaches to the patients skin. The device is designed to minimize the surface area available for biofilm proliferation, thus reducing the incidence of catheter-related bloodstream infections.

Institution

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