A Barrier System to Reduce the Rates of Line-Related Infections

Summary:
A mechanical barrier system for reducing infections associated with intravascular catheters. The invention reduces the risk of bacterial contamination of the outer surface of the catheter at the skin entry site, which in turn prevents more serious infections caused by the spread of bacteria down the surface of the catheter into the bloodstream. The barrier device functions by forming an occlusive "boot" at the skin exit site and relies on use of a cyanoacrylate adhesive to complete the occlusive junction between the boot and the contaminated skin. At time of device removal, the device-adhesive bond is safely broken through a novel bladder release method, allowing for safe removal of the vascular catheter.

Overview:
Current barriers to catheter infections include antiseptics and antibiotics applied to the entry site or embedded within the catheter itself. Though reductions in catheter-related infections have occurred with these interventions, bloodstream infections remain a problem and are associated with a concerning degree of morbidity and mortality and excess healthcare costs. KU Medical Center researchers have developed an impermeable mechanical barrier against bacteria that contaminate the catheter at the skin entry site and travel down the external surface of the catheter into the bloodstream.

Intravascular catheters

How It Works:
The invention creates an occlusive "boot" at the skin exit site of the catheter, providing stability of the catheter and, more importantly, an occlusive barrier much more resistant to bacterial migration that existing catheter bandages and securement devices. The "boot" is placed immediately after catheter placement and is secured to the skin and to the catheter with a cyanoacrylate. An in vitro study has confirmed the superior microbial barrier qualities of cyanoacrylates over pressure-sensitive adhesives currently utilized in catheter-securement devices. Despite the unique barrier qualities of cyanoacrylate adhesives, these compounds were used only in wound closure, not as device-securement adhesives as they previously did not allow for safe and quick removal of a device. To address this issue, researchers have developed a novel removal method utilizing an expandable bladder release mechanism for breaking the cyanoacrylate adhesive-skin bond, allowing for safe and quick device removal.

Benefits:
Use of the catheter barrier system will reduce the incidence of intravascular catheter infections, solving a common and long-standing problem that causes widespread morbidity and mortality, in addition to excess healthcare costs.

Why It Is Better:
This invention's mechanical barrier and adhesive offers superior infection prevention compared to existing practices and eliminates issues of organism resistance associated with antimicrobials and antiseptics.

Other Applications:
The barrier device can be used to retain an intravascular catheter in a safe, anatomic position catheter.

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