Non-Collapsible Device for Safer IV Fluid Administration during Pressurized Fluid Delivery

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Technology description

Reusable or Disposable Device Can Work with Existing Pressure Infusion Cuffs to Contain Air in IV Bag and Decrease Risk of Air Embolisms

This intravenous fluid safety device, for use during pressurized delivery of fluids, can work with existing medical pressure infusion cuffs to contain air inside intravenous (IV) bags, preventing the administration of an air bolus to a patient’ s bloodstream. An IV line connected to a bag of fluid infuses fluid directly into a patient’ s vein via a central venous line catheter. To increase the rate of delivery during a case such as an emergency, doctors sometimes employ a pressure infusion cuff, an inflatable bladder that is wrapped around the fluid bag, which squeezes the IV bag to increase the rate at which fluid is transfused into a patient’ s veins. However, when IV bags are pressurized for rapid fluid transfusion, patients are at an increased risk for an air embolism due to air common in IV bags. Air in IV bags can occur at manufactureduring manufacturing or when clinicians add patient line tubing. If air enters a patient’ s bloodstream, air generally collects in the patient’ s heart, leading to complications that could be fatal. Researchers at the University of Florida have developed an incompressible device that fits inside existing pressure infusion cuffs to retain any air inside the IV bag. This device works by preventing complete compression of the hanging IV bag’ s contents, thereby decreasing the risk of air moving to the patient.

Technology

The non-collapsible IV shell device surrounds a flexible IV bag of solution. Both the device and the enclosed IV bag can hang inside a medical pressure infusion cuff. The device is independent of the size of the fluid bag or the amount of fluid in the IV bag. About 150 cc of bag volume remains unpressurized upon expulsion of fluid fluids, trapping air in the top of the bag. This volume is adequate to prevent average amounts of air found in IV fluid bags from being delivered to the patient. The device has no sensing or other electronic devices and has minimal parts and moving pieces.

Application area

Device that decreases risk of air embolisms during pressurized IV fluid delivery

Advantages

Can be constructed as a single plastic piece and is disposable or reusable, reducing manufacturing costs
Has no moving parts, uses no electronic or sensing devices, requiring minimal hospital maintenance
Can be easily integrated into existing pressure infusion cuff devices in or post process, or be created as an add-on device, providing more options to the consumer

Institution

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