Extendable Intravenous Catheter

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Technology description

Prototype available for an IV catheter suited for infants and children < 5yrs that will last longer and can be placed by usual clinical provider without need for special training, and can eliminate the need for PICC lines.

Intravenous catheters are used for administration of intravenous medications, fluids, and blood products by care providers emergency departments, hospitals, and other patient care areas.

Placing a peripheral venous catheter (PIV) is fairly easy in adults, but can be tedious, difficult (even for an experienced provider) and time consuming in infants and younger children. It is difficult to maintain the catheter in place, due to its short length, constant movement of the extremity and noncooperation from younger children.

Under age of 5 years, the mean duration of patency of catheters is less than 2 days {<45+20 h) and it is shorter for infants and neonates.

Maintenance of patency of these catheters is important for reducing patient discomfort and need for restarting of PIV because fewer IV restarts can reduce pain and anxiety to the patient and their family members as well as conserve supplies and professional time for any busy hospital.

When IV therapy is needed for a longer duration, peripherally inserted central venous catheters (PICC) are used. These catheters require expertise on the part of provider, ultrasound guidance; require special catheter kits, fluoroscopy or other x-ray studies (during or after placement).

PICC line placement, especially in younger children and infants, can be time consuming and is associated with similar complications as central venous catheters i.e. thrombosis, infection, bleeding etc. Placement of the catheter in younger children and infants poses many problems as children have smaller and more fragile veins than adults making their veins are more difficult to locate and stabilize while inserting and securing the catheter.

Children and infants are also unable to understand and follow simple directions due to immaturity. The objective of the technology is to devise a catheter that can placed by usual clinical provider without need for special training and that will last longer than traditional IV catheters (more than 2-days).

The device consists of a polyurethane catheter with standard flashback hub at one end and corrugated section between the hub and catheter tip.

Once placed partially inside a blood vessel with use of a needle like traditional intravenous catheters, the needle is withdrawn and a ball-point tip extender device (wire) is passed inside the catheter to stretch it to its full length.

A scaled-up prototype has been fabricated, and tested on flow rate and on the force for removal.

Application area

A catheter that can be placed by usual clinical provider without need for special training and that will last longer than traditional IV catheters especially in infants and children below the age of 5.

Advantages

The technology will help maintain IV lines for longer duration and may in some cases eliminate need for PICC lines

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