Positive Pressure Heparin-Lock Small Animal Catheter

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Technology description

A unique catheter to combat various challenges surrounding traditional catheters for experiments in small animals.
The proposed catheter applies positive pressure halting the pulsatile movement of blood, and removing the need of flushing during use. In trial-error experiments, the catheter kept patency up to five days after implantation without flushing. This design improves up to 100% of success drawing blood after four days and 90% drawing blood after five days, eliminating the need for the catheter to be flushed daily. The enhanced seal exhibited by this catheter system can significantly improve the long term patency of the catheter, thereby improving experimental success and a reduction in animal use.

Background

Current methods for arterial blood draw from the rat femoral artery result in the pulsatile movement of blood within the catheter. The presence of blood in these catheters and vascular ports result in occlusion, requiring them to be flushed on a daily basis. This recurrent flushing requires precious time to be invested to the procedure, taking away from the task at hand. In addition, flushing has the potential to introduce air bubbles into the catheter or initiate the formation of blood clots at the tip of the catheter, resulting in catheter failure. Introduction of air bubbles and blood clots into the arterial circulation additionally has the potential to cause arterial obstruction and resultant ischemia. The lack of a positive pressure gradient to oppose the pulsatile pressure of the blood aids in the eventual and periodic obstruction of the catheter. Thus, a catheter with increased patency, requiring limited flushing is desired to improve successful blood draw rates and reduce surgical implantation times.

Technology Description

Researchers at the University of New Mexico have developed a unique catheter to combat various challenges surrounding traditional catheters for experiments in small animals. The proposed catheter applies positive pressure halting the pulsatile movement of blood, and removing the need of flushing during use. In trial-error experiments, the catheter kept patency up to five days after implantation without flushing. This design improves up to 100% of success drawing blood after four days and 90% drawing blood after five days, eliminating the need for the catheter to be flushed daily. The enhanced

seal exhibited by this catheter system can significantly improve the long term patency of the catheter, thereby improving experimental success and a reduction in animal use.

Advantages

Ability to prevent retrograde movement of blood during use
Improved catheter patency and experimental success
No flushing is required, retaining patency for up to five days
Designed for arterial blood draw

Institution

The University of New Mexico