

Vascular Guidewire with Microvalve¹ to Prevent Inadvertent Loss Within Body

Capstone Design Final Abstract

Group 11

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¹ The word microvalve is meant to describe the modification to the guidewire. This is interchangeable with what we refer to as a rubber stopper in this report.

I. Abstract

Central line placements are integral for many surgical and medical procedures. During central line placement, there is a 1 in 3000 chance that the guidewire used in this placement will get lost within the patient's vasculature. A lost guidewire is a critical and potentially life threatening complication in central line placements. The goal of this project was to solve the problem of lost guidewires in patients during catheter placement. Our solution was to integrate a stopping mechanism onto the guidewire that allowed the wire to pass through the central line catheter, but stop the advancement of the wire into the body if the patient were to suck the wire in through spontaneous breath, or the physician made a mistake and advanced the wire into the patient. Our prototyping resulted in a theoretical proposed design and a final prototype. The theoretical design uses manufacturing machinery to integrate a region of bristles into the guidewire that will flex to allow the catheter to pass, but still stop wire advancement into vasculature. The prototype design was a washer that would have to be added as an additional step to the guidewire after the wire has been threaded through the catheter. Modifying the current guidewire to have an additional safety mechanism would greatly reduce the chances of a wire getting lost in the vasculature and eliminate causing unnecessary injury to the patient.