Identifying and Reducing Catheter-Related Complications

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Funding:
07/01/2014 - 12/31/2017

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Anticipated Impacts on Veterans Health:
For both Veterans and non-Veterans, decreasing the occurrence of preventable hospital-acquired conditions is a national goal. The information gathered from this research could have a direct impact on the safety and well-being of hospitalized Veterans requiring catheters.

Project Background:
Urinary catheters and peripherally inserted central catheters (PICCs) are commonly placed in the acute care setting and are important for the care and management of many patients. Both devices, however, are also associated with infectious and non-infectious complications. Unfortunately, the extent of potential harms related to their use – in particular non-infectious complications – have not been fully investigated. Studies of urinary catheters have begun to identify several non-infectious complications, including catheter-related trauma, pain, dislodgement, and hematuria (or blood in the urine). Serious complications associated with PICC placement include venous thromboembolism as well as potential injuries to nerves or muscles and mechanical complications, such as kinking, coiling and malposition. Nonetheless, little work has been done to characterize the frequency and types of complications and thus the full scope of potential problems, as well as any downstream consequences, is not yet known. Strategies to prevent these harms are also in their infancy. Most safety initiatives related to the use of catheters focus on preventing infectious complications while ignoring non-infectious complications. Although preventing infections remains an important area for safety improvement, these efforts do not address the full range of complications associated with these devices. As a result, important opportunities for further improving Veteran safety and reducing potential harm to patients have neither been identified nor implemented.

Project Objectives:
-To determine the type and frequency of complications associated with the use of urinary catheters (primarily indwelling urethral catheters) placed in acute care settings from insertion up to 90 days.
-To determine the type and frequency of complications associated with the use of PICCs placed in acute care settings from insertion up to 90 days.
-To identify factors (patient, provider or device) associated with complications from the use of urinary catheters and PICCs.
-To develop and pilot test at least one strategy to reduce urinary catheter-related complications and one strategy to reduce PICC-related complications.

Study Design:
We propose to conduct a prospective observational study of patients at four medical centers, two Veterans Health Administration (VHA) medical centers and two non-VHA facilities, who have either a urinary catheter or a PICC placed during an acute care hospitalization. Data about both infectious and non-infectious device-related complications during the 90-day surveillance period will be collected from the medical record as well as by patient self-report, through a series of brief assessments and interviews.

Potential Impact:
This research takes a relatively novel approach to studying catheter-related complications and as a result may furnish a significant number of interesting findings which may positively impact a broad range of patients requiring catheters, Veteran and otherwise.