
Abstract:

Background - Prior clinical studies have used injection port lumen culture as a marker of intravenous (IV) fluid system contamination. We hypothesized that culturing injected saline (effluent) is a more sensitive method of detecting IV fluid system bacterial contamination than lumen culture. To test this hypothesis, we compared the incidence of lumen contamination with effluent contamination in a simulated setting. We also measured the effect of a novel injection port protective device (Port Guide; Matrix Tooling, Inc, Wood Dale, IL) on contamination.

Methods - In this ex vivo study, 33 providers performed 5 injections of 1 mL sterile saline into each of 4 injection port designs: (1) stopcock, (2) stopcock with Port Guide, (3) stopcock with disinfectable needleless closed connector (DNCC), and (4) stopcock with DNCC and Port Guide. The primary outcome was the rate of effluent contamination with simultaneously contaminated injection port lumen.

Results - Bacterial organisms were recovered from the effluent in 17 of the 132 injection ports evaluated. Of those 17 injection ports with contaminated effluent, 4 injection port
lumens were simultaneously contaminated (24%). Additionally, use of the stopcock with Port Guide significantly reduced effluent contamination.

Conclusion – Effluent culture is a more sensitive marker of IV fluid system contamination than injection port lumen culture. A novel protective device on the stopcock (Port Guide) significantly reduced IV fluid system bacterial contamination.