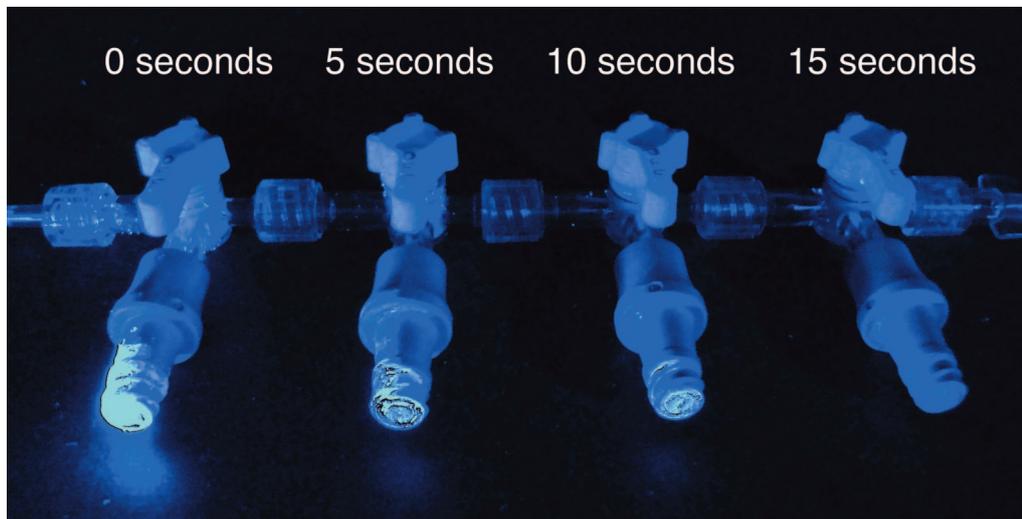


## Scrub the Hub! Catheter Needleless Port Decontamination

Justin L. Lockman, M.D., Eugenie S. Heitmiller, M.D., Judith A. Ascenzi, R.N., M.S.N., Ivor Berkowitz, M.D.\*

\* The Johns Hopkins School of Medicine, Baltimore, Maryland.  
iberkowi@jhmi.edu



**T**HE central venous catheter (CVC) is an essential tool in the care of critically ill and high-risk intraoperative patients. Catheter-related bloodstream infection (CR-BSI) related to CVC insertion technique has been greatly reduced by the use of preventive protocols.<sup>1</sup> However, late CR-BSI remains a significant threat to patient safety and healthcare cost containment. Appropriate

CVC maintenance may be the most important factor in the prevention of late CR-BSI.<sup>2</sup> Even transient improper CVC maintenance (e.g., with perioperative drug administration) may cause life-threatening CR-BSI.

We examined the effect of scrub duration on macroscopic contamination of needleless CVC connector hubs to illustrate the importance of hub cleaning. We applied commercially available fluoresceine-impregnated powder (Breviss Corporation, Salt Lake City, UT) to CVC hubs and subsequently scrubbed the hubs with 70% isopropyl alcohol pads for 0 (control), 5, 10, and 15 s. Using ultraviolet light, we exposed residual fluorescent powder on the CVC hub.

We found a direct relationship between scrub duration and powder contamination, particularly in areas with complex 3-dimensional topography. The correlation between this finding and the incidence of bacterial contamination is unclear, although Menhay has previously questioned the efficacy of a 3–5 s alcohol scrub for heavily contaminated CVC hubs.<sup>3</sup> Anesthesiologists are encouraged to follow best-practice guidelines for CVC maintenance, including attention to disinfection of CVC hubs with isopropyl alcohol pads before syringe or infusion tubing connection. Future studies are needed to determine whether increasing scrub duration will also reduce bacterial colonization and CR-BSI outcomes.

The authors thank Herbert Mann, B.S., Johns Hopkins Hospital Pediatric Intensive Care Unit, The Johns Hopkins Hospital, Baltimore, Maryland, whose artistic and photographic guidance were invaluable in the production of the image.

### References

1. Edwards JR, Peterson KD, Mu Y, Banerjee S, Allen-Bridson K, Morrell G, Dudeck MA, Pollock DA, Horan TC: National Healthcare Safety Network (NHSN) report: Data summary for 2006 through 2008, issued December 2009. *Am J Infect Control* 2009; 37:783–805
2. Polderman KH, Girbes AR: Central venous catheter use. Part 2: Infectious complications. *Intensive Care Med* 2002; 28:18–28
3. Menhay SZ, Maki DG: Disinfection of needleless catheter connectors and access ports with alcohol may not prevent microbial entry: The promise of a novel antiseptic-barrier cap. *Infect Control Hosp Epidemiol* 2006; 27:23–7