



## To Salvage or Not To Salvage the Central Venous Catheter

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As a pediatric hospitalist, I don't think it's possible to attend an administrative meeting without some mention of hospital-acquired central-line associated bloodstream infections (CLABSIs)— and for good reason—they're harmful, costly, and preventable.<sup>1,2</sup> But many children with central venous catheters (CVCs) eventually leave the confines of the hospital with their central-line in place, and remain at-risk for developing a CLABSI. What happens to *those* CVCs if and when they get infected? In this month's *Pediatrics*, Ford et al begin to answer this important question ([10.1542/peds.2020-042069](https://doi.org/10.1542/peds.2020-042069)).

In this five-center retrospective study, authors set out to identify factors associated with the decision to salvage a CVC and whether or not the salvage procedure was successful. Secondary data from 244 children ages 0-21 years experiencing a total of 460 ambulatory CLABSIs were included in the final analyses. Ambulatory CLABSI was defined using the 2015 National Healthcare Safety Network definitions modified to include only positive blood cultures drawn within  $\leq 48$  hours of hospital admission or  $> 48$  hours following discharge. Positive cultures drawn during greater than 48 hours after admission or within 48 after discharge were classified as hospital-acquired.<sup>3</sup> A salvage attempt was operationally defined as all CVCs in place  $\geq 3$  days following the initial blood culture draw. The salvage was subsequently considered a failure if the line was removed  $\geq 3$  days after the CLABSI was diagnosed. Several patient and clinical characteristics were then examined for unique associations with both the attempt to and success of salvaging the CVC.

Salvage of the CVC was attempted in 82% (379/460) of ambulatory CLABSIs and successful for nearly 76% (287/379) of the attempts. In multivariable analyses, a salvage attempt was associated with patients having

a tunneled catheter (venous catheter placed under the skin) or implanted port (venous catheter connected to an accessible port surgically placed below the skin) compared to patients with a peripherally inserted central catheter (PICC). Similarly, single-lumen CVCs had increased odds of salvage attempt compared to multi-lumen CVCs. Patients with candidemia were at significantly lower odds of a salvage attempt, whereas the presence of *Staphylococcus aureus*, coagulase-negative *Staphylococcus*, or polymicrobial infection were not significantly associated with attempt to salvage the line. Fewer factors were found to be associated with a successful salvage attempt in multivariable analyses. Only patients with a tunneled catheter were at increased odds of having a successful salvage, whereas patients with candidemia were at significantly lesser odds of successful salvage. Several other factors I would have intuitively thought as associated with attempt and success of salvage, such as receipt of a bone marrow transplant, use of antibiotic locks, and primary immunodeficiencies were not associated with either outcome.

As I process the results of this article, I reflect on my own experiences in practice. I have cared for several children in which an attempt to salvage a CVC was made. Anecdotally, the attempt is often successful, and it's reassuring to know that this work by Ford and colleagues suggest that the odds are in our favor to salvage a CVC in a child admitted to the hospital with an ambulatory CLABSI. However, this article also highlights that 1 out of every 4 ambulatory CLABSI salvage procedures are in fact unsuccessful, and very few patient-level factors are independently associated with a successful outcome. These results highlight the continued need to evaluate which children absolutely need CVCs and provide greater insight into the risk and benefits of a child being with a CVC outside of the hospital.

#### **References:**

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