Programmatic Change In Delivery Of Central Venous Port Placements: A Prospective Study Of Time And Resource Efficiency

Vijay K. Venkatesan, BA[1,2], Zachary D. McHenry, BS[1], Audrey E. Ertel, MD, MS1, Young Kim, MD[1], Derek E. Go, MS, Syed A. Ahmad, MD[1], Jeffrey J. Sussman, MD[1], Dennis Hanseman, PhD[1], Shimul Shah, MD, MHCM[1], Daniel E. Abbott, MD[3]

[1]Cincinnati Research on Outcomes and Safety in Surgery (CROSS) Department of Surgery, University of Cincinnati School of Medicine, 231 Albert Sabin Way, P.O. Box 670558, Cincinnati, OH 45267-0558
[2]Medical College of Georgia, Augusta University, 1120 15th Street, Augusta, GA 30912
[3]Department of Surgery, University of Wisconsin School of Medicine and Public Health, 600 Highland Ave, Madison, WI 53792-7375

Introduction: Central venous port placement is performed by a variety of surgeons in different subspecialties, and our previous work suggests individual surgeons—regardless of training— are the strongest predictor of outcomes. We sought to prospectively evaluate a programmatic shift towards a resource-conscious, patient-focused algorithm for this common and simple surgical procedure.

Hypothesis: An efficient surgeon in high-throughput, outpatient OR with dedicated time set aside for CVP placements using standardized ultrasound-guided venous access can reduce complications and resource utilization associated with the procedure

Methods: Following implementation of a system-side algorithm for efficient central venous ports (CVP) placement, 78 CVPs were placed by a single surgeon and evaluated in a prospective fashion. Primary outcomes were procedure time, total OR time, total facility time, and procedure-related complications. These prospective data were then compared to a retrospective cohort of CVP placement, as well as a matching cohort of interventional radiology (IR) CVP placement.

Results: The efficiency-centered (prospective) set had significantly shorter procedural, operating room (OR), and facility times. The range of OR time savings with the prospective vs. other comparison groups is 10-34 minutes, representing 22-49% reductions in OR time ($p<0.001$). Complication rates did not show a significant difference ($p=0.13$). Delay between referral and port placement was also reduced by 2 days with the prospective group as a result of infrastructural change ($p<0.05$). The median IR set case showed a 48-minute lower facility time than the median prospective case ($p<0.001$).

Conclusions: Through a programmatic change emphasizing efficiency and patient-centered outcomes, procedural/OR/facility time, as well as complications can be reduced greatly. These data provide compelling evidence that common and ostensibly simple operative procedures can be substantially improved upon with thoughtful and data-driven systems-level enhancements.

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