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Prospective Study of the Impact of Switching From an Open IV Infusion System to a Closed System on Rates of Central Venous Catheter-Associated Bloodstream Infection in a Brazilian Hospital.

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Objectives:
To ascertain the effect of switching from an open infusion system (phase one) to a closed system (phase two) on central vascular catheter (CVC)-associated bloodstream infection (BSI) rates in Brazil.
Methods:
A prospective time-series cohort trial was undertaken in adult patients admitted to three tertiary-care intensive care units, who had a CVC in place for at least 24 hours. Rates of CVC-associated BSI during a period of active surveillance with an open system (one port, externally-vented semi-rigid plastic bottles) were compared to rates after switching to a closed system (two ports, non-vented collapsible plastic bags).
Results:
Between 3/04 and 3/5, 1012 ICU patients with CVCs were enrolled. Patients during each study phase were similar with respect to gender, severity-of-illness score, underlying diseases, and longevity of the CVC.
Compliance with CVC care and hand washing was similar during both phases: presence of sterile gauze, 99.4% vs 99.9 % (RR: 1.01, 95% CI: 0.96-1.05, P: 0.82); adequate condition of the gauze, 98.5% vs 99.7% (RR: 1.01, 95% CI: 0.97-1.06, P: 0.61); presence of date on administration set, 99.8% vs 99.6% (RR: 1.00, 95% CI: 0.96-1.04, P: 0.95); and hand washing compliance, 65.4% vs 62.8% (RR: 1.04, 95% CI: 0.97-1.12, P: 0.27).
There was a total of 4,237 CVC days during phase one and 3,399 during the phase two. The rate of CVC-associated BSI during phase one was higher than during phase two (7.1 versus 3.2 BSIs per 1000 CVC-days, RR: 0.46, 95% CI = 0.23-0.91, p: 0.02).
Conclusion:
Adoption of a closed infusion system resulted in 54% reduction in the rate of CVC-associated BSIs.