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**Effectiveness of Outcome and Process Surveillance for Reducing Central Vascular Catheter Associated Bloodstream Infection Rates in 71 ICUs from 12 countries.  
Findings of the International Nosocomial Infection Control Consortium (INICC)**

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*Abstract:*

**Objective:** To determine the effect of outcome and process surveillance (intervention) on the rate of central vascular catheter-associated blood stream infection (CVC-BSI) in 71 intensive care units (ICU) from Argentina, Brazil, Colombia, Cuba, El Salvador, India, Macedonia, Mexico, Morocco, Peru, Philippines and Turkey.

**Methods:** An open label, prospective cohort, active CVC-BSI surveillance, sequential study was conducted on adult and pediatric patients admitted to tertiary-care ICUs. Rates of CVC-BSI were recorded through applying the definitions provided by CDC-NNIS system. The protocol, forms, and outcome and process surveillance methodology implemented were developed by the INICC. The data collection was performed in the participating ICU. Data uploading and data analysis were conducted at the INICC headquarters on proprietary software. The hand hygiene compliance and CVC-BSI rates during baseline were compared to the rate during an intervention period.

**Results:** The baseline period included the first four months of each medical center in the study; the intervention period lasted a mean of 17 months (range 4-100 months).

During the baseline period, 6,947 ICU patients were enrolled, and 40,764 during the intervention period.

Patient's characteristics were similar over the two periods (Patient gender, P= 0.0774; Cancer, P= 0.9062; Abdominal

Surgery, P= 0.0509; Cardiac Surgery, P = 0.3103; Coronary Insufficiency, P= 0.2419)

Hand-hygiene compliance improved from baseline to intervention period (50.7% vs 61.0% [RR= 1.11, 95% CI = 1.10 - 1.12, P = 0.0001]).

The rate of CVC-BSI per 1,000 CVC days during the intervention period was significantly lower than during the baseline period, 14.0 (418/29,920) vs 10.3 (1,326/128,521) BSIs per 1000 CVC days (RR = 0.74, 95% CI = 0.66 - 0.82, P-value = 0.0001).

The incidence of antibiotic-resistant microorganism was also reduced: Imipenem resistant *Pseudomonas sp* (45.9% vs 34.6%, RR = 0.75, 95% CI = 0.61 - 0.92, P = 0.0059); Third-generation cephalosporin resistant *Escherichia Coli* (69.0% vs 46.5%, RR= 0.67, 95% CI = 0.56 - 0.81, P = 0.0001). Rates of antibiotic-resistant microorganisms by 1,000 bed days were also reduced: piperacilin-resistant *Pseudomonas* was reduced from 2.08 to 1.58 per 1,000 bed days (RR = 0.76, 95% CI = 0.61 - 0.95, P = 0.0160), and ceph3-resistant *E.Coli* from 2.99 to 2.01, (RR = 0.67, 95% CI = 0.51 - 0.75, P = 0.0003).

**Conclusions:** Outcome and process surveillance resulted in a significant reduction of the CVC-BSI rate and bacterial resistance.

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