

Infection Outcomes in Oncology Patients Based on Type of Intravenous Connector

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Educational Objective

This project compared different rates of CR-BSI (catheter related-bloodstream infection) associated with various intravenous (IV) catheter technologies to decrease the CR-BSI incidence by refining nursing care practice, particularly in the immunocompromised oncology patient population.

Introduction

CR-BSI is a major risk for oncology patients since vascular access is required in these patients for medical tests and treatments. The FDA, SHEA/ISDA and CDC have voiced concerns about IV connectors and their relationship to CR-BSI. Very few clinical studies were found in the literature comparing different types of IV connectors in oncology patients on CR-BSIs. For example, one study showed a 50% reduction in IV occlusion rates when changing from a split septum needle-free (NF) connector to an intraluminal protection device (IPD) connector (see Chernecky et al.'s poster titled *Clinical Comparative Evaluation of Split Septum and Zero Fluid Displacement Connectors on Central Venous Catheter Occlusion*).

The **purpose** of this project was to determine the infection rates for split septum, negative mechanical valves, and IPD IV connectors in both critical care and medical in-patient oncology patients.

Since infection is a physiological response based on fibrin and biofilm formation, the **framework** used for this investigation was the dilutional and concentration theory of quantitative microbiology, bacterial load, fluid flow physics, anatomy and physiology.

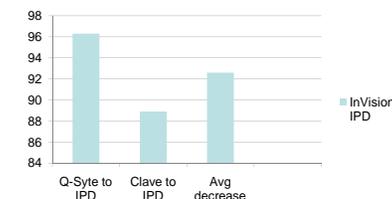
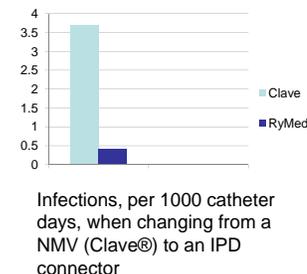
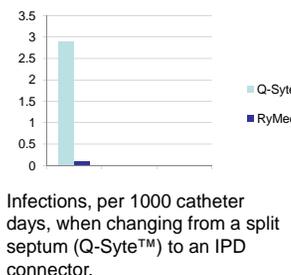
Methodology

Prospectively, Texas and New York ICU oncology and medical oncology units compared split septum (7,251 catheter days) and negative mechanical valve (NMV) IV connectors (2,477 catheter days) for a total of 9,728 catheter days to an IPD connector (9,232 catheter days) on infection rates per infection control personnel.

The identical data collection methods were used at each site and data results compared during the same time periods. No other changes in care practices or personnel occurred at the institutions. All personnel used chlorhexidine gluconate antibacterial scrub and dressing kits for care and maintenance.

Type of oncology unit	# beds	Pre: Negative Connectors	Data collection time period	Catheter days negative IV connectors	Post: Catheter days IPD (InVision®) Connector
ICU	54	Q-Syte™	18 months	7251	6901
Medical	36	Clave®	6 months	2477	2331

Results



Conclusions

1. The incidence of CR-BSI decreased 96.3%, from 2.9 to 0.1 infections per 1000 catheter days, when an IPD IV connector was used compared to the split septum.
2. Similarly, the CR-BSI incidences decreased 88.9%, from 3.7 to 0.4 infections per 1000 catheter days, when an IPD connector was used compared to the NMV.
3. **Overall**, 92.6% decrease in infection rate was found when using the IPD IV connector.

Clinical Implications

The use of the best products to reduce and/or eliminate CR-BSI incidence can negate treatment delays, add time to nursing care, decrease costs, decrease mortality, and increase quality of life for the patient with cancer and family.

Clinical nurses must be patient advocates at the bedside, in committees, and during educational in-services regarding reducing CR-BSI rates and implementing evidence-based best products.

Acknowledgement

The authors would like to thank Dr. Autumn Schumacher for her assistance with this poster.