



## **Incidence of Catheter-Related Bloodstream Infection Among Patients With a Needleless, Mechanical Valve – Based Intravenous Connector in an Australian Hematology-Oncology Unit**

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### **Flaws in the Study:**

- A. The report suggests that catheter access and manipulation was occurring on both inpatient and outpatient services for patients with Hickman catheters. Evidence related to how consistently the catheters may have been cared for outside of the hospital by the home health nurse or family member was not discussed.
- B. The report identifies two connector groups the SS group and the MV group; yet three periods of data were collected. The SS group data was collected for 4 months prior to the introduction of the MV device and for 3 months after the introduction of the MV device and the MV device had data collected from the 5 month period between the two. Combining the before SS and after SS data into one reported number creates inequity in reporting. The SS group had 7 months of data collected at different periods of time with potentially different staff, patient and conditions during these two different periods, while the MV group had 5 months of data collected continually.
- C. The report discusses that six patients developed more than 1 episode of bacteremia, but the catheters were salvaged rather than removed. It does not state whether these six patients were equally distributed between the MV group and SS group or if they were all in one group.
- D. Fig. 2 presents weekly BSI data for 3 separate periods, while the reported data puts period 1 and 2 of the SS group together. This reduces the overall BSI rate in SS group. If the data were calculated for 3 separate groups as presented in Fig.2, the second SS period group would have BSI numbers closer to the MV group, making the difference less significant.
- E. Figure 2 clearly demonstrates there was not a significant spike in the weekly number of CRBSI's until week 34 through 42, which is one 9 week period which included 7 weeks of the MV group and 2 weeks of the second SS group. Prior to this time 33 weeks of data evenly distributed between the SS group and MV group demonstrated no difference in weekly episodes between the SS and MV groups, demonstrating that some other factor is most likely responsible for the spike in CRBSI noticed from weeks 34 through 42.
- F. BSI rates in MV group for double and single lumen catheters were 17.6 and 1.5 per thousand catheter days respectively, and for SS group 6.5 and 1.2 per thousand catheter days respectively. The BSI rate in single lumen catheters was less than 1.5 in both the SS and MV groups. This most certainly suggests that the type of catheter can be a contributing factor in the BSI rates, and that the spikes observed during the SS and MV periods could be related to the application of double lumen catheters. As stipulated under the methods both catheters were used as clinically required and the results were grouped together, therefore the reported data could be influenced by this uncontrolled situation.

### **What was studied/reported:**

1. "Initiated an audit of catheter-associated BSI rates in response to a perceived increase in incidence coincident with a change from a SS intravenous connector to MV connector."

### **Conclusion:**

2. "Our findings, suggest that colonization of MV connectors may be associated with increased rates of catheter-associated BSI."

**Connectors Studied:** Interlink (before product), Clave and CLC-2000 (after products)

### **Limitations to Study:**

3. "Retrospective analysis was conducted in the latter half of 2005 after observing evidence of an anecdotal increase in the incidence of BSI during a quasi-experimental 12-month period in which 2 different access devices—an SS device and an MV device—were used during separate periods for Hickman catheters."
4. "We considered other confounding factors, such as flushing techniques or other ancillary equipment that might have contributed to the increased incidence but a limited ability to detect other confounders is a limitation of this study design."
5. The study distinguishes an SS group and a MV group of hematology and oncology patients with severe conditions. The severity of the patients and associated neutropenia may have been significantly different between the two groups. The report only discusses the type of conditions and provides no evidence to support the two groups were equal in their ability to fight the onset of infection nor does it report on the uniformity in the patient population as it relates to duration of catheter placement or presence of other infections.

### **Product deficits identified by author:**

6. "We speculate that risk of colonization of the connector device may be higher for MV devices because of the potential difficulty in sterilizing the gap between the valve and the hub."

### **References Cited:**

7. Harrington et al. (Interlink to SmartSite) "In a hospital in Melbourne, Australia a significant increase in the incidence of BSI."