Implementing Alcohol Impregnated Disinfection Caps to Reduce Central Line-Associated Bloodstream Infections (CLABSI)


Acknowledgements: The CLABSI Taskforce
Background – The Problem

- Central line associated blood stream infections (CLABSI) are risks to patient safety, increasing morbidity, mortality, length of stay and cost of medical care.
- One source of CLABSI is contamination colonization by microorganisms spreading from the extraluminal surface to the intraluminal surface of the catheter access port.
- If ports were better disinfected before and after each use, and protected from touch / surface contamination, CLABSI rates should fall.
CLABSI - Etiologies

**Early Onset or Insertion-Related CLABSIs**
- Contamination related to poor insertion techniques are believed to be the driver of early onset (<7d) CLABSIs
- Adherence to CLABSI insertion bundle (hand hygiene, full barrier precautions, gowns, gloves, masks, time-outs, etc…) target decreasing early (insertion-related) contamination/CLABSIs

**Late Onset or Maintenance-Related CLABSIs**
- Central line contamination related to poor line and/or access port maintenance are believed to be the driver of late onset (≥7d) CLABSIs
- Interventions such as “scrub the hub” target decreasing late onset CLABSIs
LUMC & Late Onset CLABSIs

- Analysis of CLABSIs at LUMC revealed 70% of CLABSI had late onsets

**SOLUTION?**

- The routine application of single use 70% isopropyl alcohol (IPA) containing disinfection devices that attach to access ports may decrease contamination of the ports and subsequent CLABSIs.
Project Aim Statement

- To reduce the incidence of CLABSIs through the use of alcohol impregnated disinfection caps for passive continuous disinfection of all access ports of all central lines.

- The greatest impact would be expected amongst late onset bloodstream infections (occurring 7 days post-insertion of device).
Project Goals

- **Historic Performance:** Rate = 1.95/1000 ICU central line days, ~ 29 patients/year

- **Threshold Performance:** Rate = 0.8/1000 ICU central line days, ~ 12 patients/year

- **Target Performance:** Rate = 0.4/1000 ICU central line days, ~ 6 patients/year

- **Maximum Performance:** Rate = 0.0/1000 ICU central line days, 0(zero) patients/year
Solutions Implemented

- Implementation of an alcohol impregnated disinfection caps for all central and peripheral IV lines
- Educational sessions for all staff on purpose and usage
- Frequent audits to ensure compliance
Results: Non-ICU

Loyola University Medical Center
Adult non-ICU Medical Unit Central Line Associated Bloodstream Infections

Initiated Alcohol Impregnated Caps

71% Decrease
Results: ICU

Loyola University Medical Center
Adult ICU Central Line Associated Bloodstream Infections

Rate per 1,000 Central Line Days

Mean = 1.77
Mean = 1.48
Weighted Rate 50th Percentile = 1.09
Weighted Rate 25th Percentile = 0.31
Initiated Alcohol Impregnated Caps

41% Decrease

n=Central Line Days
Analysis of Results

- In adult non-ICU patient care units the pre-intervention performance mean was at 1.95 infections per 1,000 patient days, and 0.56/1,000 days post-intervention. This represents an 71% reduction in CLABSI rates.

- In adult critical care units (ICUs) the pre-intervention performance mean was at 1.77 infections per 1,000 days, and 1.04/1,000 days post-intervention. This represents a 41% reduction in CLABSI rates.

- Reductions in late-onset bloodstream infections have attained reductions of 90%.
Lessons Learned

- The use of alcohol impregnated disinfection caps can aid in the reduction of late onset CLABSI events.
- Expanded use of this technology to all clinical areas should assist in reducing morbidity/mortality/↓LOS associated with CLABSI.
- Systemic adoption to central and peripheral IV sites allows for standardization of practice.
Next Steps

- Continued audits to promote compliance with usage
- Spread audit tool to all clinical areas
- Collaborate with clinical stakeholders to identify key areas for improvement