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Publication: Title and Journal/Conference

The Effectiveness of 3.15% Chlorhexidine Gluconate/70% Alcohol Hub Disinfection to Prevent Central Line-Associated Blood Stream Infections.

Poster presentation at the Association for Professionals in Infection Prevention and Epidemiology (APIC) Conference, June 2018

Methodology/Study Design:

- Quasi-experimental observational study conducted reviewing inpatient CLABSI events, locations, device days, and confounding variables over a 10 year period.
- Incidence density rates were used to compare the intervention and pre-intervention periods.

Experiment

- The 3 highest risk (of 16) inpatient units (Dialysis, Oncology and Medical Surgical Intensive Care Unit) were selected for a trial and represented 52.8% of all CLABSI infections.
- In 2013, 70% alcohol swabs and alcohol disinfecting caps were replaced by 3.15% CHG/70% alcohol swabs for central line hub disinfection prior to access.
- This intervention was trialed for a 6 month period, and then initiated on all adult inpatient units.

Results/Conclusions

- The 5 year pre-intervention period (2008-2012) showed a total of 79,191 central line days, 72 CLABSI events, and a rate of 0.90 per 1000 device days.
- The 6 month trial period involved 5,466 central line days, 3 CLABSI events, and a rate of 0.54 per 1000 device days.
- The 5 year post-implementation period (2013-2017) showed a total of 91,250 central line days, 53 CLABSI events, and a rate of 0.58 per 1000 device days.
- The post-implementation period represented a statistically significant (p-value = 0.013) reduction in CLABSI events compared to the pre-implementation period.
- 74% reduction in CLABSIs over a 10 year period represented a statistically significant (p-value = 0.013) reduction in CLABSI events compared to the pre implementation period.
- This study found that using alcohol with CHG for central line hub disinfection prior to access makes it possible to achieve the goal of reducing CLABSI events while sustaining statistically significant lower CLABSI rates.

Limitations

- With many variables involved in CLABSI prevention, it is difficult to establish full effect of CHG/ALC device swab alone.

The Effectiveness of 3.15% Chlorhexidine Gluconate/70% Alcohol Hub Disinfection to Prevent Central Line-Associated Blood Stream Infections

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Background

Central line-associated blood stream infection (CLABSI) events lead to increased complications, costs, morbidity and mortality. A review of CLABSI events was conducted at a large community hospital showing the need for improvement. Chlorhexidine Gluconate (*CHG*) may help prevent certain health care associated infections, and may also prove beneficial for the prevention of CLABSI.

Methods

Quasi-experimental observational study conducted reviewing inpatient CLABSI events, locations, device days, and confounding variables over a 10 year period. Incidence density rates were used to compare the intervention and pre-intervention periods.
The 3 highest risk (of 16) inpatient units (Dialysis, Oncology and Medical Surgical Intensive Care Unit) were selected for a trial and represented 52.8% of all CLABSI infections. In 2013, 70% alcohol swabs and alcohol disinfecting caps were replaced by 3.15% CHG/70% alcohol swabs for central line hub disinfection prior to access. This intervention was trialed for a 6 month period, and then initiated on all adult inpatient units.

Results

The 5 year pre-intervention period (2008-2012) showed a total of 79,191 central line days, 72 CLABSI events, and a rate of 0.90 per 1000 device days. The 6 month trial period involved 5,466 central line days, 3 CLABSI events, and a rate of 0.54 per 1000 device days. The 5 year post-implementation period (2013-2017) showed a total of 91,250 central line days, 53 CLABSI events, and a rate of 0.58 per 1000 device days.
The post-implementation period represented a statistically significant (p-value = 0.013) reduction in CLABSI events compared to the pre-implementation period.

Quasi-experimental Design Results

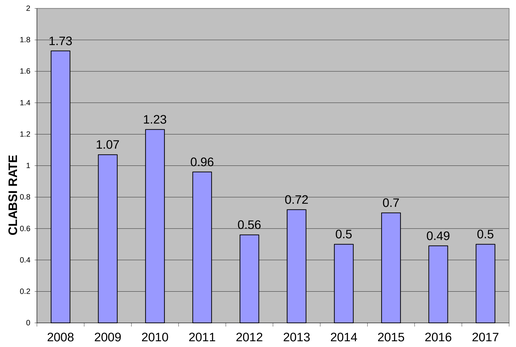
Hospital Adult Inpatient Population	Pre-intervention period CLABSI's	Post-implementation period CLABSI's	+/-Change	Post-period Longest Time Between Infections
Medical Surgical Intensive Care Unit (MSICU)	11	4	-7	**23 Months**
Cardio Thoracic Intensive Care Unit (CTICU)	3	0	-3	**56 Months**
Cardiac Intensive Care Unit (CICU)	2	3	+1	**34 Months**
Cardiac Medicine Floor-1	2	0	-2	**56 Months**
Cardiac Medicine Floor- 2	1	1	0	**37 Months**
Dialysis Floor	11	5	-6	**26 Months**
Pulmonary/Medicine Floor-1	3	4	+1	**19 Months**
Oncology Floor	18	17	-1	**11 Months**
Medical Floor-1	7	5	-2	**10 Months**
Neurology Floor	5	2	-3	**27 Months**
Orthopedic Floor-1	1	0	-1	**56 Months**
Medical Surgical Floor	0	2	+2	**36 Months**
Surgical Floor	9	10	+1	**11 Months**

Conclusions

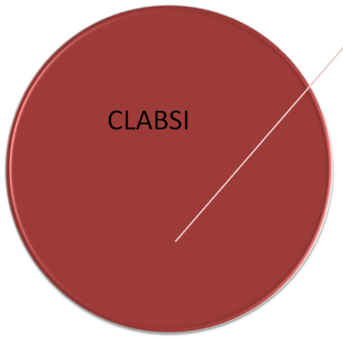
This study found that using alcohol with CHG for central line hub disinfection prior to access makes it possible to achieve the goal of reducing CLABSI events while sustaining statistically significant lower CLABSI rates.

74% reduction in CLABSIs over a 10 year period.

CLABSI Rate (2008-2017)

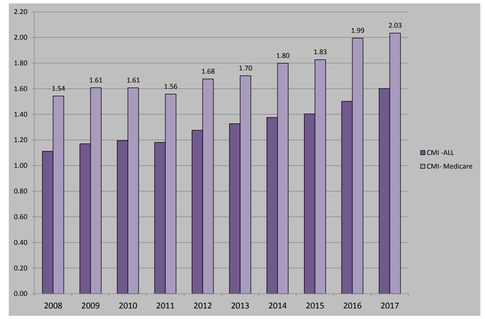


Key CLABSI Influencing Factors



- Ineffective hand hygiene
- Improper line maintenance
- Constant provider interruptions
- Patient line manipulation
- High staffing demands
- Non-functional dressing kits
- Intrinsic seeding
- Rushing & shortcuts
- Lines not removed ASAP
- Hub contamination

Case Mix Index (2008-2017)



National Healthcare Safety Network (NHSN) Statistical Analysis using a Two Incidence Density Rate.

	Pre-intervention Phase	Post-Intervention Phase
Numerator	72	53
Denominator	79191	91250
Incidence Density Rate	0.909	0.581
IDR p-value	0.013	

Nothing to Disclose

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