Background
Central Line-Associated Bloodstream Infections (CLABSI) are a preventable harm within healthcare. From late 2013 through mid-2014, our teaching hospital’s sixteen bed medical/surgical Intensive Care Unit (ICU) had an unprecedented uptick in CLABSI, from a Standardized Infection Ratio (SIR) of 0.45 to a SIR of 1.69. Previously presented at APIC June 2017.

Methodology/Study Design
- Quasi experimental; 12 month systematic process improvement
- In July 2014, a multidisciplinary workgroup formed of representatives from all stakeholders in the ICU, including senior leadership.
- Objectives were to review procedures concerning central line maintenance, perform a gap analysis, implement appropriate changes, and monitor progress in eliminating CLABSI.
- CLABSI SIR was monitored throughout the project as an indicator of success.
- Once objectives were defined, a series of improvements were implemented from July 2014 through June 2015.

Experiment
- New policy and procedures were introduced concerning the cleaning of the needleless connector and the collection of blood cultures.
- A new, easy to clean and access, needleless connector was implemented.
- A 3.15% chlorhexidine gluconate (CHG)/ 70% isopropyl alcohol (IPA) swab to “scrub the hub” each time the line was accessed was introduced.
- Finally, education was delivered regarding the maintenance of the central line and indications for central lines to improve care and utilization.

Results/Conclusions
- The CLABSI SIR dropped significantly from 1.69 in early 2014 to zero starting in July 2014.
- This change has sustained and the ICU has not had a CLABSI event in over three years.
- CLABSI can be reduced by using a multidisciplinary team of stakeholders.
- Implementing better products and best practices significantly reduce infections.
- The inclusion of different points of view offers unique solutions to problems of device associated infection and promotes lasting change.
Sustaining Over Two Years of Zero Central Line-Associated Bloodstream Infections with a Multidisciplinary Team Focus and Phased Interventions

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Abstract

Background
Central Line-Associated Bloodstream Infections (CLABSI) are a recognized preventable harm within healthcare. From late 2013 through mid-2014, our teaching hospital’s sixteen-bed Intensive Care Unit (ICU) had an unpreceded uptick in CLABSI, from a Standardized Infection Ratio (SIR) of 0.45 to a SIR of 1.99.

Methods
All cases were reviewed for common process improvement factors. The average time from central line insertion to infection was twelve days and the central line utilization ratio was over the ninetieth percentile compared to like facilities nationally. In July 2014, a multidisciplinary workgroup formed of representatives from all stakeholders in the ICU, including senior leadership. Objectives were to review procedures concerning central line maintenance, perform a gap analysis of deviations from best practices, implement appropriate changes, and monitor progress in eliminating CLABSI. Central line standardized infection and utilization ratios were monitored throughout the project as an indicator of success, with a goal of significant reduction for both measures. Objectives were implemented from July 2014 through June 2015. New policy and procedures were introduced concerning the cleaning of the needleless connector and the collection of blood cultures. A new needleless connector that was easier to clean and a chlorhexidine swab used to “scrub the hub” were introduced.

Results
Education was implemented regarding the maintenance of the central line and indications for central line removal. The central line standardized infection ratio dropped significantly to zero, sustained over two years. The central line utilization ratio decreased significantly from 9.78 to 6.81 (p<0.05), though central line utilization remains over the comparable pooled mean.

Conclusions
Central line associated infections can be reduced by using a multidisciplinary team of stakeholders. Implementing best products and practices can significantly reduce infection rates. The inclusion of different points of view offers unique solutions to problems of device associated infection and promotes lasting change.

Background
McLaren Greater Lansing is a 286 bed, two teaching hospital system in the Lansing area, and is part of the McLaren Healthcare Corporation. McLaren Greater Lansing has one Intensive Care Unit (ICU), a 16 bed mixed medical and surgical unit. Between January 2014 and July 2014, there were 7 CLABSI infections in the ICU, prompting the need for response by all stakeholders in the ICU beyond the best practice bundles used for years in the facility. A multidisciplinary team was brought together to make improvements in central line care and maintenance.

Objectives
The objectives of this multidisciplinary workgroup were to:
- Review current procedure and practice when concerning central lines to find gaps in best practice
- Implement strategies on how these gaps can be corrected and create lasting initiatives that support these changes in practice
- Monitor progress in changing practice and create additional strategies, if needed, to combat this patient safety risk

Figure One: McLaren Greater Lansing ICU CLABSI Rate

Figure Two: Progress Timeline: The Path to Zero!

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Method
Workgroup members included:
- ICU Director and Officer
- ICU Intensiveivist and Residents
- Infection Disease Physician
- ICU and ED Nursing Management and Staff
- Quality Management
- Infection Prevention
- Laboratory
- Respiratory therapists
- Dialysis staff

The workgroup met initially monthly, then moved to bimonthly and quarterly meetings. Literature on best practices for line insertion and maintenance were discussed against practices at McLaren Greater Lansing.

Interventions
Initially the following trends were identified concerning McLaren Greater Lansing’s CLABSI cases:
- Some of the seven CLABSI identified were from common commensal organisms
- In 25% of CLABSI cases, blood cultures were drawn by nursing staff off of the central line with no confirmatory peripheral blood culture, inappropriate to best practice and resulting in potentially contaminated
- Average time from line insertion to infection was approximately 12 days

Based on the defects associated with the seven CLABSI events and best practices for central line maintenance, interventions to prevent CLABSI included:
- Education to staff on appropriate central line maintenance, dressing changes, and scrubbing the hub
- Changing policy to provide more details on appropriate central line maintenance
- Enforcement of existing protocol that requires two blood cultures taken from peripheral sticks by a phlebotomist. This included empowering lab staff to speak up for this practice
- Requiring all blood cultures that must be taken from a central line be done with a phlebotomist to assist. This helped to maintain a aseptic environment for blood cultures to be taken
- Changing of all central line bundle forms to reflect best practice bundle
- Ongoing education of all staff that use central line of proper line maintenance
- Switching IV tubing and needless connector to a more staff friendly product that was easier to clean and use
- Posting “Days Without Infection” in all units and celebrating milestones of prevention
- Addition of the PDI Powerclic® Device Swab to enhance the “Scrub the Hub” process and staff buy-in
- Education of residents on choosing the best, least invasive, vascular access device for the patient
- Tracking of line utilization and using that as a measure of success in the absence of infections

Figure Two outlines the timeline of interventions.

Results
- The McLaren Greater Lansing ICU has sustained over two years without a CLABSI infection
- The last CLABSI event was in July 2014 (Figure One)
- The line utilization rate was reduced from 0.79 (January 2013-June 2014) to 0.65 (July 2014-December 2015)
- This type of reduction implies that there may have been central lines being unnecessarily used, though this utilization remains over the NHSN pooled mean.

Conclusions
- A multidisciplinary approach to CLABSI prevention helped to create sustainable improvements across the board in the ICU, resulting in zero CLABSI infections from July 2014- Present.
- The current focus for sustainability in this project is reduction of central line utilization. Our goal is to be below the national mean of utilization by line units provided by NHSN.

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References

Figure Two: Progress Timeline: The Path to Zero!