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Implementation of an Evidence-Based Wound Care Process at a Regional Burn Center Reduces Hospital Acquired Infections

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UCDAVIS HEALTH

■VAP Rate

→# VAPs

2019

#

<u>Of</u>

Infections

→ Implementation

2018

Disclosure

> We have no actual or potential conflicts of interest in relation to this program/presentation.

Background

> Burn patients are particularly vulnerable to infection due to:

Performance Data

- > HAI rates compared pre- and post-implementation using a Rate Ratio.
- \succ The number of CLABSIs declined from 3 in 2016 & 10 in 2017 to 2 in 2018 & 1 in 2019.
- Post-implementation, there was a 76% decrease in the CLABSI rate [RR=0.24, 95%CI (0.07-0.84), p=0.0262].
- > The proportion of positive blood cultures decreased by over 50% after implementation.
- > There was no statistical difference in central line device days between groups.

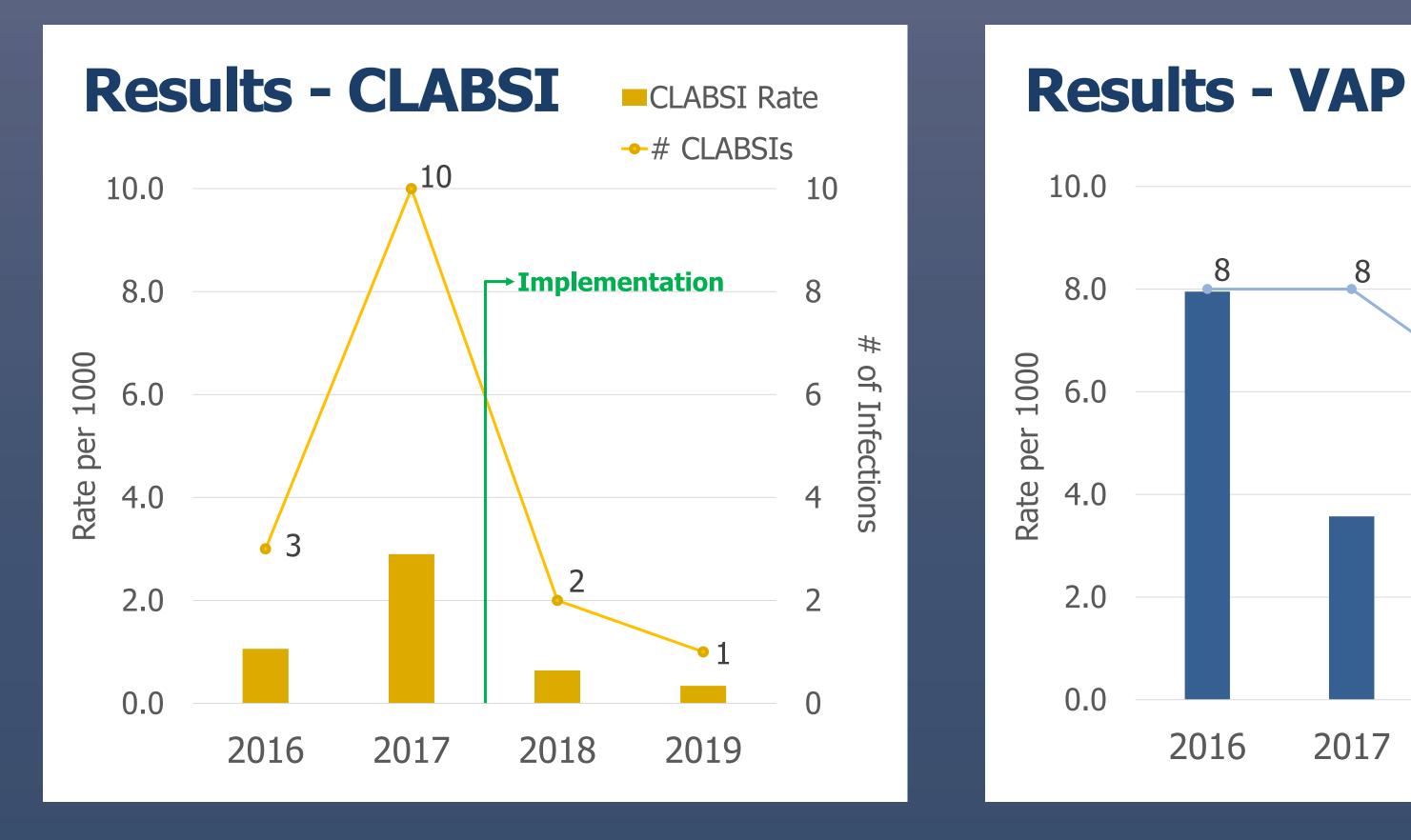
- The nature of their injury
- Prolonged hospitalizations
- Hypermetabolic and hypercatabolic conditions
- Inhalation injuries
- Frequent use of invasive devices³
- Despite national efforts to reduce CLABSI rates, burn patients have higher CLABSI rates than general ICU patients.²
- > CLABSIs are associated with increased mortality, prolonged hospitalization, and increased cost.¹
- > Improved wound infection control in burn patients may reduce the rate of CLABSI.¹
- Research showed a reduction of surgical site infections (SSI) when gowns, gloves and equipment were exchanged at critical points during surgical procedures.^{4,5}

Purpose

- To determine if implementation of an evidence-based process for wound care and central line management reduce infections.
- **Design & Methods**

> Workgroup (Quality and Safety Champion, Nurse Manager, Assistant Nurse Managers, and Clinical Nurse

- > The number of VAPs declined from 8 in 2016 & 8 in 2017 to 6 in 2018 & 2 in 2019.
- Post-implementation, there was a 43% decrease in the VAP rate [RR=0.57, 95%CI (0.24-1.33), p=0.1914].



- Educators) met from October 2017 January 2018 to develop guidelines for wound care.
- > Wound care guidelines restructured with the following:
 - Hand to elbow wash prior to wound care
 - Separating clean and dirty steps of the wound care process
 - Changing protective gear when going from dirty to clean
 - Performing the Hospital Acquired Infections (HAI) bundle elements separate from wound care, termed "Bundling the Bundles"

Conclusions

- Creating a wound care process that clearly defines and separates clean and dirty steps, similar to colorectal surgical bundles in the reduction of SSIs, reduced infection rates in a clinically and statistically significant way.
- Implementation of an evidenced-based standardized process for wound care improved infection rates at one regional burn center.

Implementation Plan

Wound Care Guidelines in the Burn ICU

Prior to starting wound care, a <u>hand to elbow wash</u> with soap and water is required

Step 1: Set up "clean" and "dirty" carts

- Clean all surfaces of the carts with hospital approved disinfectant
 Set up 1st wound care cart with "clean" supplies for re-dressing the patient (Step 4):
- Set up 1st wound care cart with "clean" supplies 1
 ✓ Cover cart with a plastic bag liner
- ✓ Set up clean dressings
- Cover clean dressings with blue towels
 Cover entire cart with another plastic b
- Cover entire cart with another plastic bag liner
 Set this "clean" cart aside under the counter fo
- ✓ Set this "clean" cart aside under the counter for use after the "dirty" Step 2 is completed
 Set up 2nd wound care cart with "dirty" supplies for cutting down old dressings and cleaning the wounds (Step 2)

Step 2: "Dirty" process of wound care

- Cut down old dressings and clean patient:
 ✓ Cut all dressings down that are accessible
- Cut all dressings down that are accessible from the front side of patient, remove all old dressings and pads from the front side and throw away, and place blue towels under extremities
- Clean the front of the patient and all extremities
- Replace towels under each extremity after cleaning and prn to maintain clean surface

tep 3: <u>Break</u> to transition to "clean" process of re-dressing patient Discard old PPE, perform hand hygiene, and don new PPE

Step 4: "Clean" process of wound care

- Obtain "clean" cart and remove top plastic bag
 Re-dress all extremities
- Re-dress an extremities
 Re-dress front if possible. If not possible, drape front with blue towels
- Designate "clean" and "dirty" person for turning
 Clean person will hold activate an their side. Distance will clean activate the second s
- Clean person will hold patient on their side. Dirty person will clean patient's back
 Dirty person will wrap water resistant pad around dirty dressings and linens
 Dirty person will return to Step 3

Development

- Resources include:
- Colorectal surgical care bundles
- University of Utah Burn Center wound care practices, as discussed with the Nurse Manager and Clinical Nurse Coordinator
- Feedback from Burn ICU staff evaluated and incorporated into guidelines.

Education

Multiple modes of education were used to introduce the new guidelines to the staff:

Further Study

It would be beneficial for this process to be replicated at other centers to further test correlation with infection reduction.

References

- Roham, Maryam, et al. "Epidemiologic Analysis of Central Vein Catheter Infection in Burn Patients." Iranian Journal of Microbiology, vol. 9, no. 5, Oct. 2017, pp. 271–276., ijm.tubs.ac.ir
- 2. Sood, Geeta, et al. "Use of Implementation Science for a Sustained Reduction of Central-Line–Associated Bloodstream Infections in a High-Volume, Regional Burn Unit." vol. 38, no. 11, 2017, pp. 1306-1311., doi:10.1017./ice.2017.191
- 3. Strassle, Paula, et al. "Risk Factors for Healthcare-Associated Infections in Adult Burn Patients." Infect Control Hosp Epidemiol., vol. 38, Dec. 2017, pp. 1441– 1448., doi:10.1017/ice.2017.220
- 4. Keenan, Jeffrey E., et al. "The Preventive Surgical Site Infection Bundle in Colorectal Surgery." JAMA Surgery, vol. 149, no. 10, Oct. 2014, pp. 1045–1052., doi:10.1001/jamasurg.2014.346
- 5. Ward, William G., et al. "Glove and Gown Effects on Intraoperative Bacterial Contamination." Annals of Surgery, vol. 259, no. 3, Mar. 2014, pp. 591–597., doi:10.1097/sla.0b013e3182a6f2d9

Clean person will place blue towels in order to turn patient onto clean surface. Replace linen
 De dress heads

Re-dress back

Re-dress front (if needed)

Throw away all supplies and clean all surfaces of the carts with hospital approved disinfectant

Please remember:

Return to Step 3 if you perform any "dirty" process, including any cleaning
 Only set up supplies for the particular task being done:

Incontinence care, including the set up for incontinence care, should be done separate from wound care. If
incontinence care happens to be at the same time as the anticipated wound care, set up for and perform
incontinence care first, change PPE, and then start at Step 1 above

Bundle care:

- Trach, foley, and central line dressing change bundles should be performed *per policy* <u>separate</u> from wound care
 Cleaning of the trach plate, changing of trach gauze, and changing of inner cannula should be done <u>separate</u> from wound care
- Changing of trach ties, dressings under trach ties, or ETT ties may be done at the *beginning* of wound care (with the exception of patients with herpes on their face this care should be done at the *end* of wound care)

Change PPE between wound care and airway care



- PowerPoint presentations at staff meetings
- Guidelines laminated and posted in each patient

room for reference

Addition of guidelines to current policy

Acknowledgements

Firefighters Burn Institute Regional Burn Center, University of California, Davis.

Heather Martin MPH, UCDH Epidemiologist.

 \succ University of Utah Burn Center.