Central Line Infections: The Beginning of the End?

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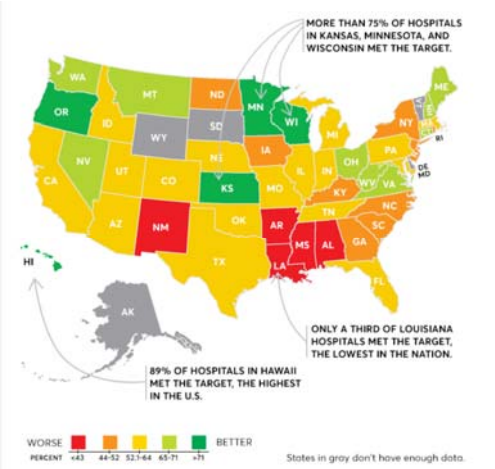
Purpose

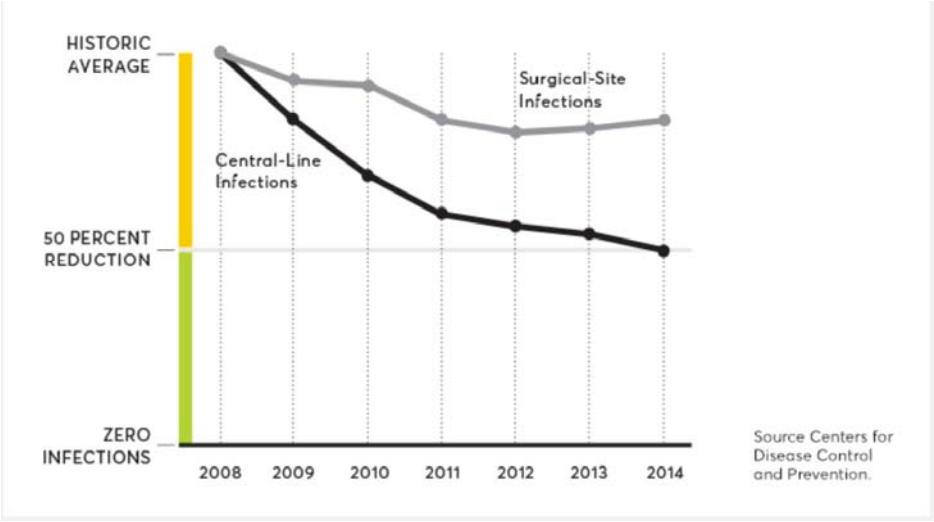
- **Hospital acquired infections** (HAI) are a major source of morbidity and mortality, particularly for ICU patients. A recent report estimated a four fold increase in mortality rate for ICU patients with HAI.[1]
- In 2009, the annual estimated cost of HAI ranged from **28.4 to 33.8 billion dollars**.[2] As part of the Affordable Care Act, CMS introduced the **Hospital-Acquired Condition Reduction Program.** This program reduces payment to hospitals which have high rates of HAI and thereby incentivizes best practices for infection control.



Percentage of states which met the national target for central line infections in 2015.[3]

Purpose

- **Central line associated bloodstream infections (CLABSI)** are a major source of **potentially preventable HAI**.
  - A recent Consumer Report publication titled “Zero Tolerance for Deadly Hospital-Acquired infections” presented data gathered by the CDC’s National Health Safety Network. The data shows we have **completely eliminated** CLABSI in ICU patients at the Mount Sinai St Luke’s and Mount Sinai West campuses.[3]
- The goal of this presentation is to highlight the various steps taken at the institutional, departmental, and individual levels which we believe contributed to our success in completely **eliminating CLABSI in ICU patients** at our institution.

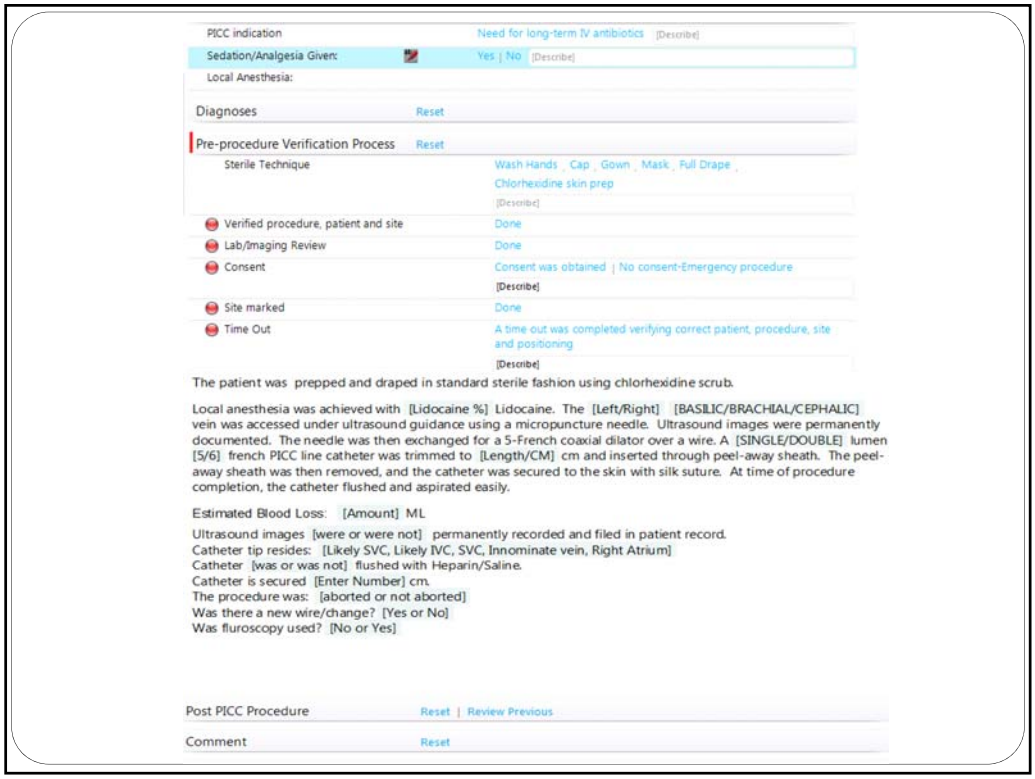


Infections rates for two hospital acquired infections from 2008 to 2014.[3]

Methods

•The **CDC** has established best practice guidelines for the elimination of CLABSI's. We identified quality improvement practices that were implemented to eliminate central line infections at Mount Sinai St Luke's and Mount Sinai West. Ensuring buy-in from all stakeholders was critical during the initial steps.

- All inpatient **peripheral inserted central catheter** (PICC) lines are now placed by the **interventional radiology** (IR) department in a **sterile interventional suite**
  - Prior to this time, PICC lines were placed at bedside by a PICC team
- Requests for central lines are now **assessed for appropriateness** based on clinical necessity
- Required use of **antiseptic port protectors & chlorhexidine-impregnated sponges**
- A **PICC line sepsis team** evaluates all catheter failures
- **Daily central line audits ensure** proper management of PICC lines
- An **11 day duration limit** was placed reducing number of days an inpatient may have the same PICC line



PICC indication — Need for long-term IV antibiotics [Describe]
Sedation/Analgesia Given: — Yes | No [Describe]
Local Anesthesia:

Diagnoses — Reset

Pre-procedure Verification Process — Reset

Sterile Technique — Wash Hands , Cap , Gown , Mask , Full Drape , Chlorhexidine skin prep [Describe]
Verified procedure, patient and site — Done
Lab/Imaging Review — Done
Consent — Consent was obtained | No consent-Emergency procedure [Describe]
Site marked — Done
Time Out — A time out was completed verifying correct patient, procedure, site and positioning [Describe]

The patient was prepped and draped in standard sterile fashion using chlorhexidine scrub.

Local anesthesia was achieved with [Lidocaine %] Lidocaine. The [Left/Right] [BASILIC/BRACHIAL/CEPHALIC] vein was accessed under ultrasound guidance using a micropuncture needle. Ultrasound images were permanently documented. The needle was then exchanged for a 5-French coaxial dilator over a wire. A [SINGLE/DOUBLE] lumen [5/6] french PICC line catheter was trimmed to [Length/CM] cm and inserted through peel-away sheath. The peel-away sheath was then removed, and the catheter was secured to the skin with silk suture. At time of procedure completion, the catheter flushed and aspirated easily.

Estimated Blood Loss: [Amount] ML

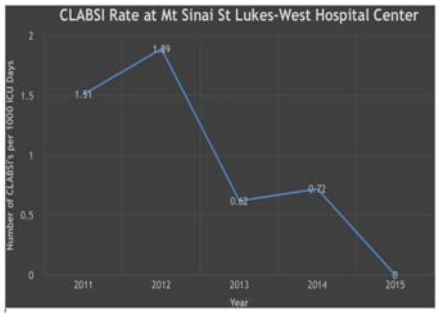
Ultrasound images [were or were not] permanently recorded and filed in patient record.
Catheter tip resides: [Likely SVC, Likely IVC, SVC, Innominate vein, Right Atrium]
Catheter [was or was not] flushed with Heparin/Saline.
Catheter is secured [Enter Number] cm.
The procedure was: [aborted or not aborted]
Was there a new wire/change? [Yes or No]
Was fluroscopy used? [No or Yes]

Post PICC Procedure — Reset | Review Previous
Comment — Reset

Results

- Data from **CMS** showed that Mount Sinai St. Luke's-West demonstrated a decreasing trend in central line infections from 2011 to 2014.

Year	# of days ICU patients had central lines	# of bloodstream infections
2011	9,248	14
2012	8,990	17
2013	9,750	6
2014	6,945	5
2015	6,326	0



Hospital Name	City, State	2011	2012	2013	2014	2015
HIGHEST-SCORING TEACHING HOSPITALS						
Advocate Lutheran General Hospital	Park Ridge, IL					
Froedtert Memorial Lutheran Hospital	Milwaukee, WI					
Hahnemann University Hospital	Philadelphia, PA					
HonorHealth Scottsdale Osborn Medical Center	Scottsdale, AZ					
Long Island Jewish Medical Center	New Hyde Park, NY					
Maimonides Medical Center	Brooklyn, NY					
Medical Center Health System	Odessa, TX					
MedStar Franklin Square Medical Center	Baltimore, MD					
Memorial Hospital of Rhode Island	Pawtucket, RI					
Methodist Healthcare Memphis Hospitals	Memphis, TN					
Mount Auburn Hospital	Cambridge, MA					
Mount Sinai St. Luke's - Roosevelt	New York, NY					
North Shore University Hospital	Manhasset, NY					
Ochsner Medical Center	New Orleans, LA					
OhioHealth Grant Medical Center	Columbus, OH					
OhioHealth Riverside Methodist Hospital	Columbus, OH					
Saint Barnabas Medical Center	Livingston, NJ					
San Francisco General Hospital and Trauma Center	San Francisco, CA					
Sentara Norfolk General Hospital	Norfolk, VA					
St. Joseph Mercy Ann Arbor	Ypsilanti, MI					
St. Luke's University Hospital - Bethlehem Campus	Bethlehem, PA					
Staten Island University Hospital	Staten Island, NY					
The University of Toledo Medical Center	Toledo, OH					
UC Irvine Medical Center	Orange, CA					
UMass Memorial Medical Center	Worcester, MA					
University of Chicago Medical Center	Chicago, IL					
University of Missouri Hospitals and Clinics	Columbia, MO					
University of Tennessee Medical Center	Knoxville, TN					
University of Texas Southwestern Medical Center	Dallas, TX					
University of Washington Medical Center	Seattle, WA					
Upstate University Hospital	Syracuse, NY					
West Virginia University Hospitals	Morgantown, WV					

Highest scoring teaching hospitals from 2011 to 2015.[3]

Conclusion

- We believe that the policy/logistical changes we have highlighted subsequently eliminated CLABSI at our institution.
- **Achieving buy-in from all stakeholders, implementing a quality initiative to constantly monitor ways to prevent occurrence, and utilizing standard technique and audits for all procedures, have each played a crucial role.**
- **All hospitals should be able to follow similar steps to eliminate CLABSI.**

References

1. 22nd European Congress of Clinical Microbiology and Infectious Diseases (ECCMID): Poster 1128 and abstract O312. Presented April 1, 2012.
2. Douglas Scott II, R. (2009, March). *The Direct Medical Costs of Healthcare-Associated Infections in U.S. Hospitals and the Benefits of Prevention*. Retrieved from cdc.gov.
3. Levine, H. (2017, January). Zero Tolerance for Deadly Hospital-Acquired Infections. Consumer Reports. Retrieved from consumerreports.org.
4. Rajaram, R., Chung, J.W., & Kinnier, C.V. (2015). Hospital Characteristics Associated With Penalties in the Centers for Medicare & Medicaid Services Hospital-Acquired Condition Reduction Program. *JAMA,* 314(4):375-383.