

The Five Pillars Of Safety In Healthcare **Appendix**

Surfacide, LLC™

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INTRODUCTION

WHERE IT BEGAN

What happened on April 1, 2009?

Besides it being April Fools' Day, this day marked an important occasion for Enloe and our patients. April 1, 2009 was the date of Enloe's first Quality Summit. This annual gathering was intended to look at Enloe's place in the broader environment of health care, to be transparent about our own performance and to set three to five important quality improvement goals that were to be attained in one year. After that year, we would come back to report our progress and set more goals.

The three years prior to 2009 were very challenging for Enloe. Patient experience and outcomes were at a low point. Organizational morale was low. Through the Quality Summit, we declare the kind of hospital we want to be and set our sights on becoming that hospital.



PROGRESS

MAINTAINING THE GAIN

Striving for consistency in process and outcome, Enloe continually monitors progress made on earlier quality initiatives.

Sepsis

Sepsis is a serious, life-threatening condition where an infection has threatened many important functions in a person's body. Mortality rates can be very high with severe sepsis and septic shock: 20% and 46% respectively, according to published benchmarks. At the first Quality Summit, in 2009, Enloe formally adopted best practices in the treatment of sepsis. The results have shown sustained reductions in mortality that consistently outperform published benchmarks. Lives are being saved.

Severe Sepsis and Septic Shock Mortality



Planetree and Patient Satisfaction

In 2007, patients expressed their dissatisfaction with Enloe by ranking the hospital in the lowest 2nd percentile in the nation. They did so by answering the question: On a scale of 1-10, how would you rate your hospital? As measured by the Hospital Consumer Assessment of Healthcare Providers and Services (HCAHPS), this metric indicated the work needed to create a patient-centered healing environment. Enloe committed to this effort, and in 2018 achieved the Planetree Gold Certification for Excellence in Patient-Centered Care. Part of that achievement was input from patients about their experience. Since 2011, Enloe's patients have consistently ranked Enloe in the top 25th percentile, reflecting the strong impact of Planetree's patient-centered culture.

HCAHPS Rate Hospital: 2007 – 2017 Patients who rated Enloe a 10 on a scale of 1 to 10



Improving Mother and Baby Care

Enloe obstetricians and pediatricians, with their nursing colleagues, turned their focus on the optimal time to electively deliver babies. Data shows that babies do better when delivered no earlier than 39 weeks gestational age. From a high of 7.75% elective deliveries before 39 weeks (2007), Enloe now achieves best-practice performance with less than or equal to 1.5% elective deliveries before 39 weeks. (This is better than the national goal of less than or equal to 5%). Also, Enloe maintains a primary Cesarean-section rate for first-time mothers at term with the single baby in the head-down position at below (better than) the state target of lessthan or equal to 23.9%. Both projects were part of the Hospital Quality Institute's California Maternal Quality Care Collaborative.

Elective Delivery Rate Earlier than 39 Weeks Gestation



37 Enloe Quality Summit

Enloe Outpatient Therapy

As the largest physical, speech and occupational therapy group north of Sacramento, this team of experienced professionals is rated as "excellent" by over 92% of patients in the past five years.

Urolift Treatment for Prostate Gland Enlargement

Urolift is a new treatment for benign prostatic hypertrophy. Also known as prostate gland enlargement, this condition affects 40 million U.S. men annually.

Heparin Bedside Rounds

Daily charge-nurse rounds on patients with heparin drips reduced medication errors associated with this medication on the Telemetry Care Unit. With this practice now implemented hospital-wide, those improvements are expected to be seen on other units.

Reducing Hospital-Acquired Infections

Ultraviolet light disinfection is used to reduce hospital-acquired infections (HAIs) by eliminating difficult-to-remove infectious agents. With its use, the HAI rate decreased by close to 50%.



Hospital-Acquired Infections Before and After Room Sterilization With UV Light

Leadership Development on the Cardiovascular Unit

Charge nurses on the Cardiovascular Unit (CVU) built upon house-wide charge nurse leadership training to form stronger teams, improve efficiency and increase leaders' confidence.

Continuing Medical Education and Tumor Boards

The physician Continuing Medical Education (CME) program is changing with the times to offer online education, journal clubs and video education. Tumor boards grew from one general cancer tumor board to three: breast, colorectal and general cancer tumor boards.

Anticoagulation Clinic

Time in Therapeutic Range (TTR), linked to positive outcomes, is greater than 82% for patients taking warfarin monitored at the clinic or doing self-testing at home.

What Matters to Me?

Changing from a culture of "What's the matter with you?" to "What matters to you?" Fifth Floor Medical/Neurological implemented the "What Matters to Me" program to improve patient and staff experience.

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Ensuring Clean Surfaces

To reduce hospital-acquired infections, Environmental Services uses the adenosine triphosphate (ATP) cleaning verification system to confirm the cleanliness of patient rooms after patient discharge and before another patient occupies the room.

Spirit of Planetree Awards

Representing some of the best in patient-centered care, hospitalist Edward O'Regan, M.D., received Enloe's 2018 Physician Champion Award, Roxanne Roberts, resource lab assistant, received the Caregiver Award, and the Endoscopy Clinic received the Program Award.

Enloe Inpatient Pediatrics

Enloe's pediatric nurses help ease anxiety, pain and fear for their young patients with art supplies, fun blankets and pillows, and even wagons and "princess carriages" to encourage them to play and move about.



Patient and Family Advisory Council (PFAC)

The PFAC brings the patient and family voice to hospital leadership, giving guidance on projects from wayfinding signage to the "What Matters to Me" communication tool. Enloe member Ronnie Campbell was selected to join the Planetree International PFAC.

Planetree Gold



After a 12-year journey, Enloe achieved Planetree Gold Certification for Excellence in Patient-Centered Care. Enloe is one of only 79 hospitals worldwide and one of four in California to achieve this major milestone.

Enloe Inpatient Rehabilitation

Compared with national benchmarks, patients at the Enloe Rehabilitation Center receive significantly more minutes of therapy treatments and are able to be discharged home more often.

Respiratory Support for Hospice Patients

Enloe Hospice is able to provide patients with specialized respiratory support that allows them to be more comfortable and alert when at home for end-of-life care.

Culture of Safety

Responding to staff input, staff are educated about the importance of a culture of safety, both physical and psychological, and are given tools to create this culture in the workplace.

Culture of Cleanliness: Reducing Hospital Onset Clostridium difficile

MedStar Health is ten hospital non-profit, community-based health system service the Baltimore/Washington region.

The Journey

The MedStar leadership team has always been committed to delivering excellent patient care and strives to set the bar high throughout the communities they serve. As they looked at their strategic roadmap to improve patient outcomes and experience, it became clear that there was an opportunity for the Environmental Services team to play a critical role. From there, the "Culture of Cleanliness" initiative was born. In order for this initiative to be successful, senior leadership knew that a shift in thinking around their environmental services processes, protocols and technology was needed in order to truly transform.

Senior leaders established that a multifactorial approach was necessary to achieve the established objectives. As part of the bundled approach, Surfacide UVC technology was acquired and implemented in all ten hospitals. The implementation spanned from December 2015 to February 2016 and each site completed a thorough training and certification process.

Surfacide Utilization

The key stakeholders established that the initial focus for improvement would be directed towards the reduction of hospital-onset (HO) Clostridium difficile infections (CDI) given that the CDI rate in the previous year was not to MedStar's desired quality and safety targets.

Reducing CDI would dramatically improve patient outcomes and overall experience while reducing the impact of reimbursement penalties. Clinical and operational leaders

developed a protocol for Surfacide system use and training to specifically target C. diff. The development of a targeted protocol and clear documentation of the plan was critical so that the operators knew the expectations and compliance with the scope could be monitored on an ongoing basis.

	Surfacide UVC Scope of Use							
Patient Rooms Public Restrooms	 Occupied patient room restrooms when patient is identified as being positive for C. diff (daily) Any room after discharge or transfer when patient is identified as being positive for C. diff Any ICU room after discharge when available Any room that Infection Control deems necessary due to outbreak, infection, etc. Other Isolation Rooms upon discharge when possible Public restrooms will be serviced overnight (10pm- 6am) as time permits once other UV obligations have been met 							
Operating Rooms	 All operating rooms used by patients identified as being C. diff positive Operating rooms will be done nightly after terminal cleaning on a scheduled rotation (no less than one time per week) Any other operating rooms deemed necessary by OR staff due to infection, outbreak, etc. 							
Procedure Rooms	 Any procedure rooms used by patient identified as being positive for C. diff Any other procedure room requested by nursing due to infection/outbreak/etc. 							

Continuous Improvement

All of the utilization data from the Surfacide system is synced to a cloud-based portal (SURFcloudTM), offering complete visibility into how and when the Surfacide system is being used. This provides the teams access to critical data regularly to monitor protocol compliance and identify areas for improvement and additional use. The MedStar and Surfacide teams developed custom reports to monitor the capacity at which the equipment was being operated each month. These reports allow leadership to identify opportunities beyond the initial scope for additional cycles to be run each day. On a monthly basis, the EVS teams review the additional bandwidth of the technology and strategize with the clinical team at each facility to identify specific use cases that correspond with the facility's clinical objectives.

Results & Discussion

The Hospital Onset C. diff rate (incidence per 10,000 patient days) declined significantly since implementing the "Culture of Cleanliness" campaign. To establish this, the Infection Prevention team monitored the results daily and discussed with the Environmental Services team regularly. As a result of the communication and regular reporting, the Surfacide utilization continued to increase, while the Hospital Onset C. diff rate across the system showed a dramatic downward trend each year. During the July 2016 to September 2019 timeframe, MedStar was able to achieve a 59% reduction in hospital onset C. diff across the ten-hospital system, while other factors remained the same. Furthermore, through the analysis of the Surfacide utilization data along with the infection data, MedStar was able to identify a correlation between Surfacide and CDI rates.



Faxton St. Lukes Mohawk Valley Health System

Historically our healthcare system has experienced a significant burden of both community-onset (CO) and hospital-onset (HO) Clostridium difficile infection (CDI) cases. While progress had been made in CDI reduction in the last 5 years, infection rates at MVHS have remained above national and state targets despite the use of both standard and intensified reduction efforts. At the end of 2017 we developed the C.DIFFerently campaign. C.DIFFerently was launched in January 2018. The campaign was designed to introduce a layered approach to CDI reduction by supplementing our existing prevention programs.

Prior to launching the C. Differently campaign, an extensive literature review was conducted prior to the development of the campaign components. This included numerous peer-reviewed journal articles, best practice guidelines from the CDC, the Infectious Disease Society of America (IDSA), the Society for Healthcare Epidemiology of America (SHEA), and the Greater New York Hospital Association. In addition to published resources we identified other healthcare delivery systems that have successfully decreased their HO CDI rates. We reached out to other medical centers to learn more about their successful prevention programs.

In addition, to focusing on greater utilization of the Surfacide multiple emitter UV-C technology, additional individual interventions were combined to create a bundled approach to CDI prevention. We began by introducing several new cleaning products. The first of which was a Hydrogen Peroxide cleaning solution which has shown, in some studies, to be more effective at eliminating C.difficile spores than the quaternary ammonia cleaner that has been used at MVHS in the past. In addition to the Hydrogen Peroxide solution we continued to use a bleach based cleaner to clean and disinfect all equipment in the rooms of patients who tested positive for CDI as bleach is one of the few sporicidal solutions to be FDA approved to definitively kill C.diff spores. Because floors have recently been found to play a greater role in CDI transmission than was once thought, we began using a sporicidal floor cleaner on all floors at MVHS. A new product called Easy-Screen was also introduced in clinical areas. Easy-Screen is specifically designed to clean electronic devices such as smart phones, tablets, computers and other equipment without damaging the screens. In an effort to encourage patients to perform hand hygiene we provided them with PDI Sani-Hands wipes. These wipes allow patients to clean their hands, even if they are bed bound, without relying on the assistance of a caregiver. Since shared equipment can act as a vehicle for CDI transmission we sought to introduce new disposable equipment wherever possible. Disposable blood pressure cuffs replaced fabric cuffs which were particularly difficult to clean. A disposable cuff is now issued to each patient on admission to be used throughout their stay. We began testing shared equipment and environmental surfaces with an ATP monitor. The ATP monitor detects organic matter and allows us to determine the contamination level of a surface. All of these products are designed to decrease the burden of C.difficile spores in the environment, but we also wanted to help Nurses and Medical Providers to more accurately screen and test patients for CDI. So we developed an algorithm that allows Nurses to assess patients for the presence of CDI symptoms and risk factors. Nurses are able to use the algorithm to initiate both testing and presumptive contact precautions if indicated. An order set was developed which encouraged Medical Staff to limit testing to symptomatic

patients. In order to put a "face" to our campaign a mascot was designed by the Marketing department. At the launch of the campaign we announced that we would be holding two competitions. The first competition was designed to increase the visibility of the campaign by allowing staff members to submit name suggestions for our mascot. We received over 250 entries from staff before selecting the name "Flora"; A nod to the normal flora in our intestines that is often disrupted and displaced by C.difficile. To encourage the use of the diagnostic algorithm and to promote the importance of environmental cleanliness we were given \$4,000 by the MVHS Senior Leadership team to be awarded to those Nursing units and EVS departments that were the most successful at implementing the C.DIFFerently campaign components.

HO CDI cases are publically reportable at both the State and Federal level. This allows us to compare MVHS with other facilities throughout New York State and the country. Infection rates are released annually from the New York State Department of Health. HO CDI rates are reported as the number of cases per 10,000 patient days. The NYS benchmark for HO CDI is 5.2. In 2017 the HO CDI rate at FSLH was 7.5 and 6.4 at SEMC. At the National level, infection rates are released from the CDC's National Health and Safety Network (NHSN). Infection rates from NHSN are reported as a Standardized Infection Ratio (SIR). A SIR greater than 1.0 indicates that more HAIs were observed than predicted; conversely, a SIR less than 1.0 indicates that fewer HAIs were observed than predicted .The 2017 HO CDI SIRs at FSLH and SEMC were 1.299 and 1.253 respectively, demonstrating that both facilities were reporting higher than expected numbers of HO CDI.

After designing the components of the program, our next step was to establish meaningful process measurements that would allow us to monitor the success of our various interventions. Those measures included appropriate use of the screening and testing algorithm by Nursing, appropriate use of the order set by Medical Staff, successful utilization of the UV light disinfecting system in all C.difficile patient rooms and compliance with environmental cleaning procedures as measured by the ATP monitor. We conducted a cost- benefit analysis which we brought to the Resource team for approval to purchase the new products that would be introduced. We launched the program by giving a short presentation to the MVHS leadership group. The presentation summarized our interventions, our measurements and the terms of the competition. We repeated the presentation for the Quality Excellence Council, Medical Staff, Infection Prevention Committee, Nurse Quality Practice Improvement Council, and MVHS Board. A Net-learning module was also released to all MVHS staff.

In developing the CDIFFerently program we strove to exhibit the MVHS I-CARE values at every level.

Integrity- CDI prevention protects the safety of our patients and residents, our visitors and our staff. We have worked diligently to identify opportunities for improvement and to implement positive changes.

Compassion- CDI can be devastating. The disease is not only dangerous and life threatening, it is also uncomfortable, and embarrassing. In order to fully understand the implications of a CDI diagnosis we must remember to consider the infection not just in terms of dollars and reimbursement. We need to be mindful of the many ways in which the patients themselves are affected.

Accountability- Before putting together the CDIFFerently program we conducted a tremendous amount of research into innovative prevention methods and evidence-based practice. We wanted to make sure that we were designing a high-quality prevention program to maximize the benefit to our patients. A major component of the program was developed with our patients' physical environment in mind.

Respect- Because there are multiple factors that contribute to the transmission of CDI, we knew that a multi-disciplinary team would be pivotal to our prevention efforts. It took the combined efforts, expertise and talents of Infection Prevention, Environmental Services, Quality, Communications, Information Technology, Laboratory, Nursing and Medical Staff to design and implement an effective program.

Excellence- CDIFFerently embodies the value of excellence by using best-practice research, innovation, and team-work to develop and sustain high quality care.

The purpose of the CDIFFerently campaign was to decrease cases of HO CDI, which we were able to do. We saw a 30% decrease in HO CDI cases at FSLH and a 12% reduction at SEMC. Viewed as a whole system this means that there was an 18% decrease for MVHS. The HO CDI rate at FSLH is now below the New York State benchmark of 5.2 for the first time. While SEMC remains slightly above the State benchmark our goal is now to keep up the momentum and continue heading in the right direction. We have also seen the SIRs at both facilities drop. The SIR at FSLH is now 0.847, which is again the first time that we have been able to bring the SIR under 1.0 at FSLH. SEMC is slightly above 1.0 at 1.12 year to date, however the second quarter data at SEMC shows a SIR of 0.784, so we remain hopeful that we will be able to bring the SEMC rate under 1.0 by the year's end. Of note, the SIR is the measurement used by CMS to assess the effectiveness of our health-care associated infection reduction efforts for reimbursement purposes.

We have closely monitored and reported the progress of our process measures throughout the campaign. Data has been reported monthly to all stakeholders. The EVS departments at both hospitals have worked diligently to increase the number of patient rooms that are treated with the UV light disinfection system. Year to date they have managed to treat 96% of all CDI contact precaution rooms. In addition to treating those rooms that we know to have been contaminated with C.diff, we challenged EVS to treat as many non-isolation patient rooms as possible. The total rate of UV treated discharge rooms has increased from 9% to 14% at FSLH and from 4% to 14% at SEMC. To measure adherence to the diagnostic algorithm we monitored the ratio of positive to negative tests. We found that as we began to screen patients more accurately the ratio of positive to negative tests increased, indicating that fewer tests were being performed on patients who did not meet testing criteria. We also conducted a random sampling of 30% of the patients with negative test results to see if the algorithm was followed appropriately. Our audits revealed that 72% of patient at FSLH and 45% of patients at SEMC were screened appropriately for CDI. Lastly we conducted random samplings of environmental surfaces to monitor contamination levels. We tested shared patient equipment that the Nursing staff is responsible for cleaning as well as surfaces and equipment that EVS is responsible for. While we did see a gradual increase in the number of Nursing items that tested "clean", the EVS numbers remained approximately the same.

We plan to continue monitoring the process and outcome measures as stated above on a monthly level. This will allow us to address any troubling trends in a timely manner with additional education and reinforcement of the interventions. The CDIFFerently team will now be combined with the Hand Hygiene team since hand hygiene plays such an important role in preventing the transmission of CDI. This will bulk up the membership of the Hand Hygiene team which will facilitate the collection of a robust amount of hand hygiene observations and allow us to more accurately monitor our compliance with hand hygiene opportunities. Since we have not seen as great of a decrease in HO CDI cases at SEMC, and we have also tracked lower compliance with the diagnostic algorithm we will be looking for new opportunities to educate the staff at SEMC about the correct way to apply the algorithm. Next we plan to investigate the feasibility of implementing an electronic hand hygiene monitoring system. This would allow us to collect data on hand hygiene performance without any observational bias. With accurate data we can then tailor our interventions and education to address the fallout that occurs. We plan to expand the practice of replacing shared patient care items with disposable items whenever possible. The next step in this process will be to implement the use of single-patient use, disposable thermometers for all patients at the SEMC campus. Disposable thermometers are currently used by all patients at FSLH but are only used for patients on isolation precautions at SEMC.

The cost of a single case of HO CDI is approximately \$34,157 and 7.8 day increase in length of stay. In 2017 MVHS reported a total of 92 cases of HO CDI amounting to an estimated cost burden of \$3,142,444 and 717.6 days of lost revenue. By reducing the HO CDI rate by 18% our campaign has achieved a \$565,640 cost savings, as well as eliminating 129 days from the length of stay. Expenditures for the CDIFFerently campaign included approximate annual costs of \$25,000 for the Sani-Hands wipes, \$28,000 for the sporicidal floor cleaner, \$14,000 for the Hydrogen Peroxide cleaning solution and Easy Screen cleaning wipes, \$15,000 for the ATP monitors and testing supplies and \$47,000 for the disposable blood pressure cuffs. All together this amounts to \$129,000 that was spent on this initiative. This brings the total cost savings for MVHS to \$436,640 for 2018.







UV Tech Scripting Guidelines

The following are the standards for scripting to patients when treating their restroom with UV light

Patient Restroom Treatment

- □ Remember to always put on proper PPE prior to entering patient room if it is an isolation
- □ Smile and knock on the door
 - "Good morning, I am with housekeeping, may I come in?"
- Continue to smile/make eye contact and walk toward patient bed
 - "Hello Mr./Mrs. _____, my name is ______ and I am with the housekeeping department."
 - "My goal is to keep your room and restroom clean at all times. If you don't mind, I would like to treat your restroom with our UV light technology. The UV light treatment provides a safe, additional level of disinfection for you during your stay."
 - "I will put a UV tower in the restroom and follow proper protocol to ensure the area is secure. The cycle will take 5 minutes and will disinfect the surfaces of the restroom. This treatment is meant to enhance the daily cleaning efforts of your housekeeper to keep you safe from infection."
- Offer the patient a pamphlet if you have one so they can read about the treatment while you run the cycle
 Set up the machine and run the 5-minute restroom cycle
 - "Mr/Mrs , please make sure to not enter the restroom until the cycle is complete."
- Start taking down the machine
 - "You might notice a clean odor in the area treated; I assure you it is safe and will dissipate within 10-15 minutes. You are able to use the restroom right away"
 - "Before I leave, is there anything else you need from housekeeping?"

EVS partnership with Surfacide UV HCAHPS Pilot

- Hypothesis: visual presence of UV tower and proper scripting (attached) in occupied patient room restroom can drive patient satisfaction scores. Patients receive their survey after discharge. Environmental Services' presence must be memorable so that patient will recall a positive experience when filling out their survey. The use of a UV emitting tower creates a "moment" for the patient.
- Worked with 3 institutions to determine "focus units" on which to test this hypothesis. Unit criteria was 1) Permanent Housekeeper assigned to unit; 2) Baseline (previous yr) HCAHPS score between 50%-65% Top Box. This percentage is seen nationally as an average that is "movable." Movable defined as not so low that circumstances are in play that will prevent an increase; not so high that a score increase is unlikely. Further, the department must be adequately staffed to treat 80% of occupied room restrooms Monday-Friday on each proposed unit. This was tracked along with patient sat scores. The pilot was run over the course of THREE MONTHS at each location.
- Units were identified at the University of Maryland St. Joseph Hospital, Olathe Medical Center, and Ohio State University. Ohio State University was able to provide 3 units: 2 at the Ross Heart Hospital, and 1 at University Hospital.
- Compass One Health Care National Director of Patient Experience, Grant Randall, worked with EVS Directors at each location to track room treatments and HCAHPS scores. The attached spreadsheet provides scores for the 3 month pilot time, the score for the month prior to pilot initiation, and an average of the 3 months. Baseline month score against average of the pilot month's scores for each facility are as follows:

0	University of Maryland: 5 th Floor East Wing	+6.7%
0	Olathe Health: 4 North	+9.7%
0	OSU: Ross Heart 7 th Floor	+17%
0	OSU: University Rhodes 9 West	+32.3%
0	OSU: Ross Heart 5 th Floor	+9.1%

HCAHPS UV Pilot Program

The Ohio State Universtiy CLOSED							
12/1/18 - Ongoing Nov Dec Jan Feb March April May						May	
Ross Heart - 7th Floor	69.2%	82.9%	84.0%	91.7%	90.0%	75.0%	79.4%

The Ohio State University CLOSED						
3/1/19 - Ongoing Feb March April May						
University - 9 W Rhodes	50.0%	83.3%	63.6%	100.0%		

The Ohio State Universtiy CLOSED						
2/4/19 - Ongoing Jan Feb March April May						
Ross Heart - 7th Floor	66.7%	81.5%	77.8%	68.2%	67.7%	

University of Maryland St. Joseph Hospital CLOSED					
2/1/19-5/31/19 Feb March April May					
St. Joseph - 5th floor East Wing	64.5%	66.7%	61.1%	85.7%	

Olathe Health OPEN						
6/1/19 - 8/31/19 May June July Aug						
4 North						





