CHANGE : OUTCOME

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impact

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A better way.

NICO ARNOLD

EXECUTIVE VICE PRESIDENT,
WORLDWIDE COMMERCIAL OPERATIONS,
CEPHEID

From the editor

Welcome to the second issue of our new magazine, IMPACT. Cepheid's Systems & Solutions group publishes this magazine quarterly — providing you with informative articles that can help you **impact** total cost of care, create a higher level of patient satisfaction, and lower infection rates in your facility.

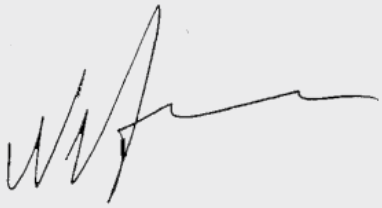
First and foremost, thank you for the many positive and enthusiastic comments we received on the introduction of this magazine. We are happy to hear that IMPACT addresses the critical cost and clinical effectiveness issues you deal with on a day-to-day basis. New technologies often appear to be more costly at first glance. But, if introduced appropriately, many of these technologies prove to be significant cost savers and even revenue generators for the hospital. At the same time, many have a positive impact on clinical effectiveness and patient and staff satisfaction. There are many of these win-win situations and we are anxious to continue sharing them with you.

In this edition we have 2 new examples. The first is from Moses Cone Health System in North Carolina, where hospital management made a decision in 2010 to **make it happen** and invest aggressively to reduce their MRSA infection rates. The results are impressive. The second example comes from Dr. Jorge Parada, who illustrates how Loyola University Hospital in Chicago not only improved patient safety, BUT profitably succeeded in fighting two HAI's.

In both of these cases, the greatest barriers to success were the silos between the budgets of different hospital departments. These examples illustrate that the lab and the hospital need to look at the big picture and introduce the concept of "Total Cost of Care."

The lab's role is to provide results that medical professionals need in making appropriate clinical decisions. Our role, as an industry, is to develop the most effective diagnostic tools. If in the end both the patient and the hospital **win** — what would stop the introduction of new technologies?

Enjoy reading this issue,



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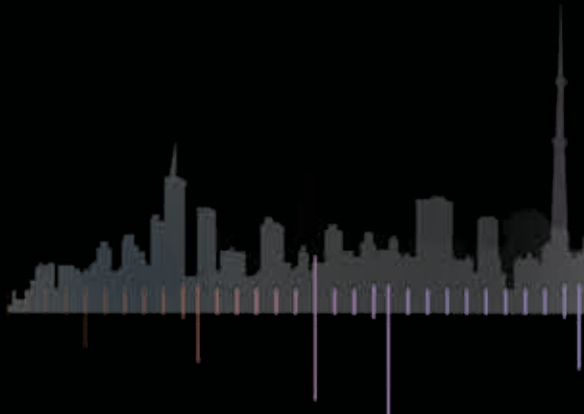
ON THE TABLE



FEATURE

The Perfect Storm

Multi-campus Health System Fulfills Senior Management Challenge to Dramatically Reduce HAIs

CONTRIBUTED BY
MELISSA G. MORGAN, BSN, RN, CIC

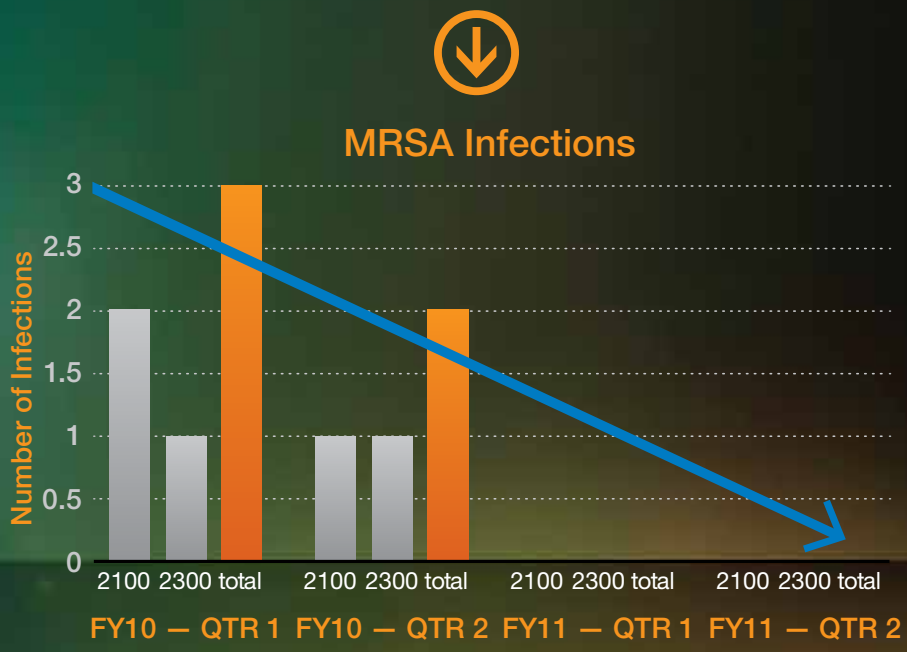
INFECTION PREVENTION DATA ANALYST

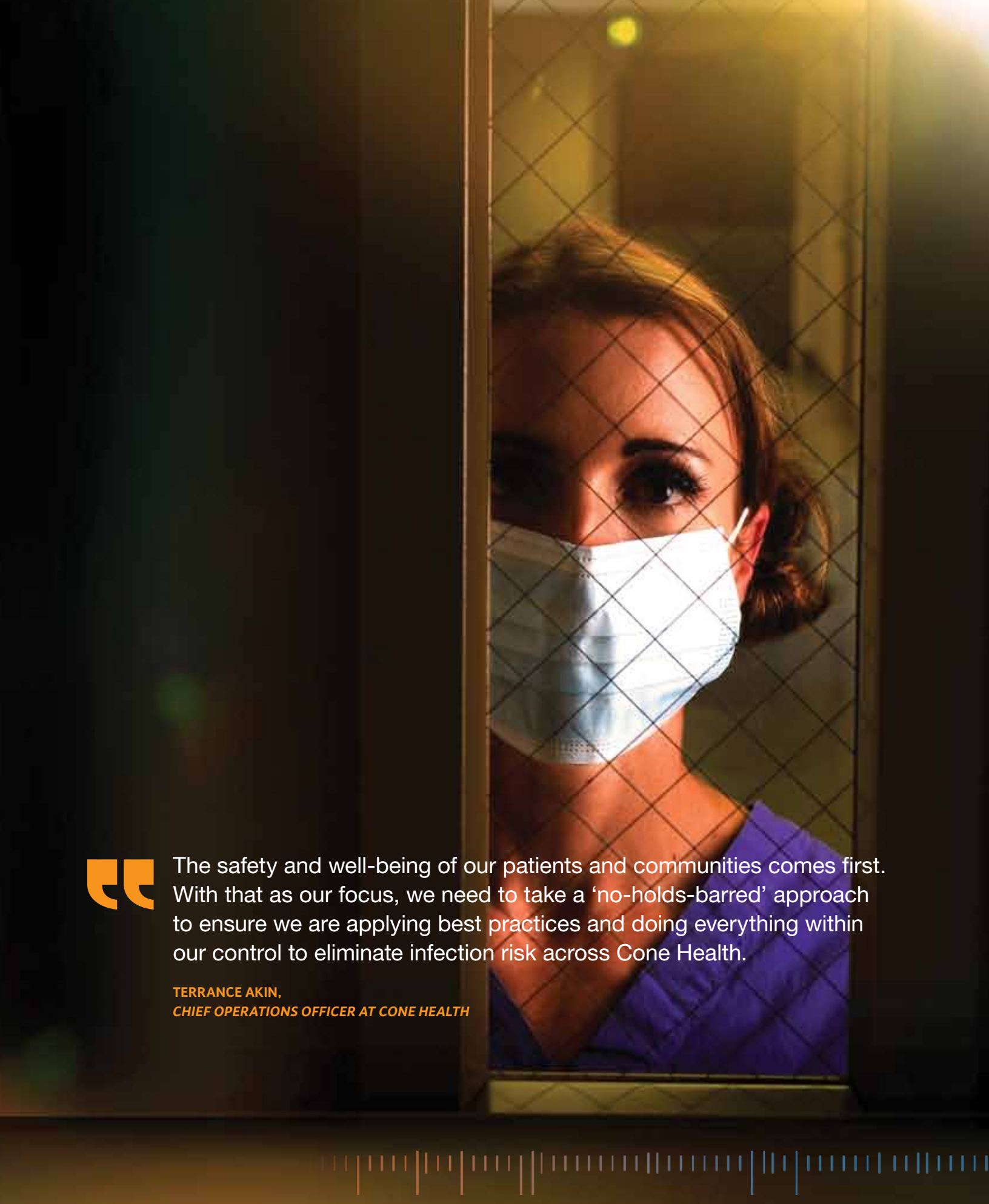
CONE HEALTH

From December 2007 through December 2010 Cone Health (known as Moses Cone Health System at the time) participated in the VHA initiative to prevent healthcare–associated MRSA infections.

As part of this initiative, they implemented a number of interventions such as requiring all ICU patients to bathe in chlorhexidine gluconate, hand hygiene programs for healthcare providers, and environmental cleaning programs. Despite all these efforts, the MRSA transmission rate remained stagnant — ranging from 0.05 to 0.72 per 1,000 patient days. Cone Health consistently ranked in the lowest 10% of hospitals participating in the VHA initiative.

This situation was particularly frustrating for members of the infection prevention team who knew there were other things that could be done to impact infection rates. In December 2010, they got what they needed.





> The safety and well-being of our patients and communities comes first. With that as our focus, we need to take a 'no-holds-barred' approach to ensure we are applying best practices and doing everything within our control to eliminate infection risk across Cone Health.

TERRANCE AKIN,
CHIEF OPERATIONS OFFICER AT CONE HEALTH

CONE HEALTH
5-CAMPUS HOSPITALS
NORTH CAROLINA

In December 2010, during a presentation to the Quality Leadership Team (QLT) about the status of the VHA initiative, new COO Terrance Akin challenged the Infection Prevention team to **"make it happen."** What followed was a remarkable transformation of the infection prevention program at Cone Health.

Coincidently, six months prior to the meeting with the QLT, the Infection Prevention team had been piloting a MRSA surveillance trial using Cepheid's rapid PCR testing technology for patients in three ICUs. The results of the pilot were impressive. In six short months they were able to achieve surveillance compliance rates over 95%. Knowing which patients were colonized with MRSA allowed the Infection Prevention team to closely monitor those patients to make sure that decolonization protocols were being implemented in a timely manner.

As a result of the pilot program data and meetings of the MRSA Taskforce, several key components for a new approach to HAI prevention at Cone Health were identified:

1. Infection Prevention was provided with two additional FTEs and two other ICP were promoted to leadership roles (Infection Prevention Manager and Infection Prevention Data Analyst). A new electronic data mining system was implemented to provide the ICPs real-time data on a patient's colonization status and the status of infection prevention measures implemented.

2. Surveillance testing was expanded from the original three units to patients in all ICUs, including step-down units as well as to all high-risk and pre-surgical patients. All this was implemented a period of over six months. To accommodate the dramatically increased testing volume (approximately 2,000 tests/month) the laboratory acquired a **GeneXpert® Infinity System.**

3. Environmental Services' efforts were supplemented by the acquisition of a Xenex™ Disinfection System for the decontamination of rooms previously occupied by patients infected with MRSA. This system helped remove human error from the process of properly cleaning and disinfecting patient rooms to help ensure better compliance with environmental cleaning policies.

4. Education of clinical personnel as well as patients and their visitors was expanded through a program titled, **"Step up. Scrub up."** The basis of this program was the World Health Organization's five steps to hand hygiene improvement. The program assisted in gaining better hand hygiene compliance among more than the 8,000 employees of Cone Health.

Savings

$ 3,710,196	Cost of Care Before the Program
- $ 1,340,581	Cost of Care After the Program
$ 2,369,615	Total Reduction in Cost of Care

The early results were impressive. In the first six months of the program, Cone Health has not seen a single MRSA infection. The program has also proven to be successful from an economic perspective.

Our active surveillance program has reduced the cost of infections for the health system in these three units alone by more than $2 million. When we compare the patients who acquired an infection before the pilot to during the pilot we see the cost decrease from $3.7 million to $1.3 million. Subsequently, reducing hospital days for these patients by more than 1,300 — allowed those beds to be used for additional patients, notes Melissa Morgan, Infection Prevention Data Analyst at Cone Health.

Comparing Same Time of Year — Infections

Units	Before	After
2100	6	0
2300	2	0

Comparing Same Time of Year— Patient Days

Units	Before	After
2100	3646	3350
2300	3577	3444

Comparing Same Time of Year — Rate

Units	Before	After
2100	1.65	0.00
2300	0.56	0.00

SOLUTIONS

Part 1

Increase Revenue and Improve Patient Safety

How Loyola University Hospital has Profitably Succeeded Against 2 HAIs

CONTRIBUTED BY
JORGE P. PARADA,
MD, MPH, FACP, FIDSA

PROFESSOR OF MEDICINE, STRITCH SCHOOL OF MEDICINE LOYOLA UNIVERSITY CHICAGO

Patient Safety: Increased Accountability and *Never Events*

Hospital administrators are all too aware of increasing requirements for hospitals to be transparent and accountable for patient safety. Data can now be easily compiled and compared across regions, states, and even countries. This provides strong bases for national patient safety goals and lists of Never events. Never events are outcomes that should never occur, and if they do, the hospital literally pays: for associated testing, drugs, and lengthened hospital stays, because the insurance companies and government will refuse to foot the bill for additional costs that should not have been incurred. Additionally, failing to meet national safety goals can mean being cited or losing accreditation — also an expensive proposition.

HAIs are a key source of skyrocketing costs

If all these factors weren't enough, the rise of the internet and social media has enabled widespread publication of this data, impacting consumer choices regarding healthcare providers, and ultimately impacting hospital revenues. Measures that increase cost efficiency while increasing patient safety are clearly to everyone's benefit. In this three-part series of articles, we explore some key steps Loyola University Hospital has taken to meet the challenges of both patient safety and revenue.

MRSA a clear target. Loyola's starting point:

When healthcare-associated infections are discussed, MRSA is a popular topic. MRSA is staph: methicillin-resistant *Staphylococcus aureus*. It is a bacteria that typically lives on the skin and is also the leading cause of skin and soft tissue infections. In hospitals, post-op wound infections and invasive measures (breathing tubes, catheters, etc.) provide a multitude of opportunities for invasive MRSA infections.

The associated costs of MRSA are approximately $3.2 to 4.2 billion annually, associated with increases in:

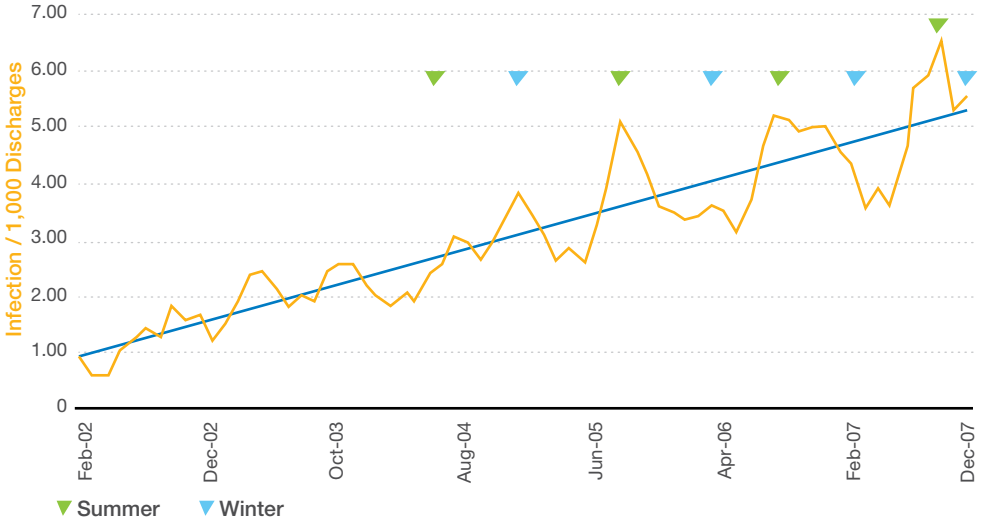
- Average length of stay
- Increased costs (treatment, protective measures, etc.)
- Morbidity
- Mortality

MRSA is a still-growing problem in the United States. In recent years, MRSA incidence has continued to climb, and ***Figure 1*** shows the 566% increase in MRSA infections presenting to Loyola University Medical Center over the six years 2002–2007. Over the course of screening for MRSA at Loyola, more than 100,000 patients have been screened and 1 in 15 was found to be carrying MRSA upon admission.

High rates of MRSA infection are fixable. That has been proven. In the 1960s, Denmark, Holland, other EU countries saw MRSA rates rising, and took measures to drive them down. This contrasts with what occurred in the United States where when MRSA infection rates climbed little was done in response.

ED-Culture Confirmed MRSA Infection Rate 2002—07

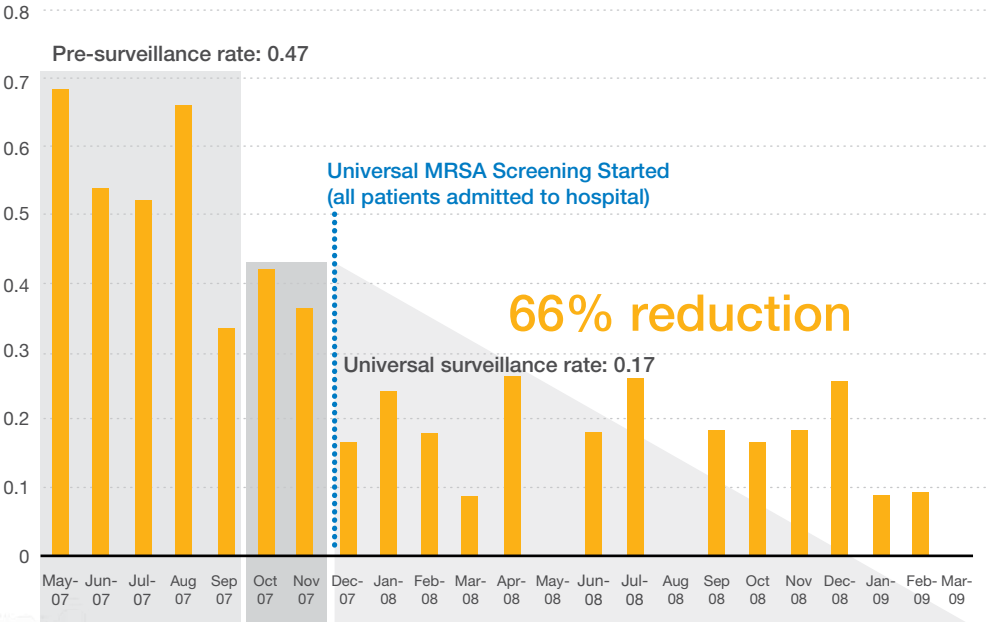
Figure 1



LOYOLA UNIVERSITY HOSPITAL

Hospital-Associated MRSA Infection Rates

Figure 2



Speed Counts

Traditionally, the approach to infection control has been reactive. No action was taken until a positive blood or wound culture was obtained. Culture time to result was a few days, and during that time the patient's MRSA infection went unrecognized and the patient could be a source for MRSA to be spread throughout the hospital by healthcare workers — who, it is well recognized, are imperfect in their hand hygiene practices. Worse, traditionally cultures were only taken when deemed necessary because of infection. The 1 in 15 MRSA rate mentioned earlier? Many of the patients carrying MRSA were only colonized, not infected. Without screening for asymptomic carriers of MRSA, we only find the tip of the iceberg – patients with flagrant infections — but miss the bulk of patients with MRSA. This is a major reason the key to controlling and reducing the spread of MRSA is rapid identification of all patients with MRSA, so that isolation and treatment can be implemented immediately.

Implementation

At Loyola University Medical Center, the challenge rapid and accurate identification of patients with MRSA was addressed by implementing a universal surveillance system for all patients being admitted to hospital. Key to Loyola's success was using the GeneXpert, which provides far more sensitive results than culture and decreased the time to result was from days to only two hours. In addition to the universal surveillance for all hospital admissions, Loyola also conducted preliminary studies with the Emergency and Orthopedic Departments.

ER testing

Loyola's emergency room performed a study to see how rapid MRSA screening compared to culture in an ER setting, and if it would have an impact. There was initial concern that it might slow down or create a bottleneck in the ER, where speed is critical. However, the results of the study were quite positive:

- No bottleneck or increase in stay
- 25% greater ideal antibiotic choice
- Increased physician and patient satisfaction that they were leaving the ER knowing if they had MRSA or not

Orthopedics

The Orthopedics Department also conducted a study on the impact of rapid MRSA screening. This department performs a large number of elective knee replacements and elective hip replacements. Because these are elective surgeries, patients shop extensively for their doctor, and are extremely interested in the infection rates they find online.

People with MRSA have an even higher rate of surgical site infections than people who don't. By identifying the people with MRSA before their surgery, the Orthopedics Department was able to treat them pre-operatively. The results:

- No increase in pre-surgery prep time
- Decreased rates of post-surgical infection

While each of the three populations (main hospital, ER, Orthopedics) had certain specific issues of interest, they unanimously found the rapid screening to be demonstrably valuable.

Total Results

Looking at the two years before Loyola University Hospital implemented universal surveillance through the first 16 months of data, there was a 2/3 drop in surgical site infections *(Figure 2)*. Over 200 MRSA infections were prevented.

Financial

- Hard savings of more than 1.5 to 2 million dollars per year
- Revenue opportunities: 1,200 patient days saved, making those beds available for other paying patients
- MRSA education/clinic brings in revenue
- Tangential: great publicity from media attention to the universal surveillance program and from being the recipient of a hospital leadership award

Patient Safety and Quality of Care

- Over 200 cases of hospital-associated MRSA avoided
- Surgical site infections overall decreased by 1/3
- MRSA surgical site infections decreased by 50%

Rapid and highly sensitive universal screening proved key in Loyola's successful campaign against MRSA — a prevalent and costly HAI. In this series' next article, we'll look at Loyola's *C. difficile* efforts, and the impact of rapid screening on a very different type of challenge.

INSIDE

Part 2

Diagnostic Marketing Association Names Cepheid 2011 Marketer of the Year

The Diagnostic Marketing Association (DxMA), which serves marketing, regulatory, and medical affairs professionals in the diagnostic and device market segments, presented its 2011 Marketer of the Year Award to Cepheid at the annual DxMA Global Marketing Summit on April 25, 2012. The award recognizes innovation by marketers seeking to highlight their company and products at the leading edge of the diagnostic industry.

Cepheid was selected for its **Art Meets Innovation** campaign. To unveil its redesigned GeneXpert® Systems at the 2011 American Association of Clinical Chemistry and Clinical Lab Expo, Cepheid partnered with Paul Jr. Designs, a world-renowned builder of custom motorcycles, to build a custom bike themed on its new GeneXpert Systems and molecular diagnostic testing. The live unveiling event was filmed for the popular Discovery Channel show American Chopper. The epic bike had to be "as cutting-edge and innovative, yet as elegant as our technology," said Cepheid CEO John Bishop. An entire marketing campaign, including a road show with the bike, was developed around the **Art Meets Innovation** theme.

> **The Marketer of the Year Award is the highest accolade DxMA offers for diagnostic companies. It recognizes outstanding work that raises the bar in diagnostics marketing. In a crowded field, Cepheid stood out with its 'Art Meets Innovation' marketing campaign, by demonstrating the strongest commitment to marketing innovation, boldness and execution that symbolizes both Cepheid and its GeneXpert on-demand molecular testing technology.** Robert Speziale, President DxMA.

ROBERT SPEZIALE
DXMA PRESIDENT

JOHN BISHOP
CEO, CEPHEID

JARED TIPTON
SENIOR DIRECTOR OF CORPORATE COMMUNICATIONS, CEPHEID

ROBERT MCGONNAGLE
PUBLISHER, CAP TODAY

ART MEETS INNOVATION

In here is a Crazy idea!

FACT.

The March issue of CDC Vital Signs reported that *C. difficile* infections are at an all-time high. Deaths related to *C. difficile* increased 400% between 2000 and 2007, due in part to a stronger germ strain.*

FACT.

C. difficile germs move with patients from one health care facility to another, infecting other patients. Unnecessary antibiotic use in patients at one facility may increase the spread of *C. difficile* in another facility when patients transfer. When a patient transfers, health care providers are not always told that the patient has or recently had a *C. difficile* infection, so they may not take the right actions to prevent spread.

FACT.

Half of all hospital patients with *C. difficile* infections have the infection when admitted and may spread it within the facility.

FACT.

C. difficile infections cost at least $1 billion in extra health care costs annually.*

* Making Health Care Safer: Stopping *C. difficile* Infections, published March 2012 in CDC Vital Signs

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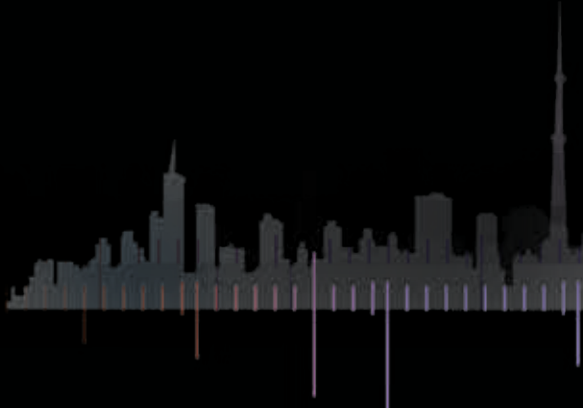

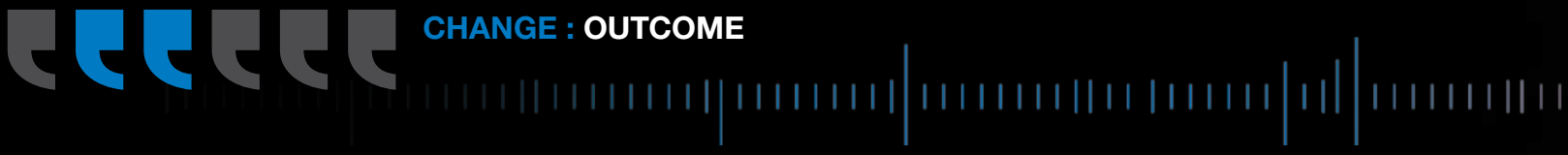

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