

## Positive Deviance

### Busting the MRSA Myth

*“If you always do what you always did you’ll always get what you always got”*

1 day Conference  
8<sup>th</sup> July 2009 at The University of Leeds  
09.00 – 17.00

Provided by the CIHM and Plexus Institute

This workshop presents the astounding results from using positive deviance techniques in 6 hospitals in the USA where they have achieved significant reductions in MRSA rates. Several hospitals saw MRSA infections in intensive care units drop to zero. Hospital wide HA-MRSA infections declined 35% to 84%. In a study of MRSA incidence the CDC found reductions up to 62 percent. In addition, as MRSA rates dropped, the hospitals saw a decline in the proportion of *Staphylococcus aureus* infections caused by methicillin-resistant bacteria, signifying that hospitals can make headway in the fight against drug-resistant superbugs.

#### AIMS

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- Learn about the Positive Deviance process for social and behavioral change
- Hear how it has been used in the US on MRSA prevention and medication reconciliation (proper use of medications by patients following hospital care)
- Learn and practice some key PD facilitation skills
- Explore possible applications of PD in UK Healthcare facilities

## IT WORKS!

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The latest data from hospitals in the Plexus Institute PD MRSA Prevention Partnership showed a 73% reduction in healthcare associated MRSA infections in intensive care units from the beginning of the PD effort in mid 2006 through 2008 (two hospitals had 0 HA-MRSA infections in their ICUs) - The US Centres for Disease Control and Prevention (CDC) recently presented some findings from the effort at the 2009 meeting of the Society for Healthcare Epidemiology of America. The CDC developed another measure of change in MRSA rates called a clinical incidence density measure. Of special interest is that the CDC findings document the fact that in these hospitals the staph aureus bacteria has changed and become less resistance to antibiotics, thus making infections easier to treat.

## OPENING THOUGHTS

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*Somewhere in your community or organization, groups of people are already doing things differently and better. To create lasting change, find these areas of positive deviance and fan their flames.*

**Jerry Sternin**

*In US healthcare facilities more than 46 of every 1,000 patients were infected or colonized with MRSA—a rate as much as 11 times greater than previously estimated.*

**Association for Professionals in Infection Control and Epidemiology**

*We've made more progress on MRSA in the last six months than we have in the last 14 years.*

**Jerry Zuckerman, MD**

*As a healthcare professional who works to make hospitals safer, Positive Deviance is the most effective approach I've seen in a 23-year career.*

**Nancy Iversen, RN**



## In the USA

**Healthcare associated infections are among the top ten leading causes of death in the United States.** These infections afflict two million patients every year and a growing number of infections are resistant to standard antibiotic treatment. The antibiotic resistant infection most frequently identified in US hospitals is **Methicillin Resistant Staphylococcus Aureus (MRSA)**. In 1972, the CDC reports, only two percent of *staph aureus* infections were antibiotic resistant. By 2004, sixty three percent of them were.

An October 2007 *Journal of the American Medical Association* article reported MRSA infections rates in the healthcare settings were far higher than previously believed, with more than 94,000 invasive infections and more than 18,000 deaths for the year 2005 alone. Despite the diligent efforts of many healthcare professionals, these infections continue to increase, causing needless suffering, death, and billions of dollars of additional costs in healthcare.

## In the UK

MRSA bloodstream infections are a significant cause of morbidity and can be difficult to treat because of their multiple antibiotic resistance. Infections lengthen hospital stay and increase morbidity and, in some cases, result in death.

The 2004 national Public Service Agreement (PSA) set out the target of halving the number of MRSA bacteraemias (bloodstream infections) in NHS acute and specialist trusts in England by March 2008. To achieve this target, each acute and specialist trust with more than 12 MRSA bacteraemias in 2003/04 (the baseline year) was expected to achieve either a 60% reduction in the number of bloodstream infections by 2007/08 or a maximum of 12 infections in 2007/08. Trusts with 12 or fewer infections in 2003/04 were expected to maintain or reduce these levels. The 2008/09 NHS Operating Framework and the 2007 Public Service Agreement 'Ensure better care for all' sets out the target of maintaining the national annual number of MRSA bloodstream infections at less than half the national number in 2003/04. As such, trusts are required in 2008/09 to ensure that their trajectories are not exceeded so that, collectively, the level of infections nationally is maintained at less than half the number in 2003/04.

The current NHS MRSA bacteraemia rate per 10,000 bed days is 1.19.

## The Facts

The Association for Professionals in Infection Control (APIC) calls MRSA a "major public health problem."

Infections are not inevitable. MRSA is a sturdy bug, but it can be killed and its spread halted. The basic procedures to prevent the transmission of MRSA

and other healthcare associated infections have all been well known for years: hand washing, gloves and gowns, and isolation of infected and colonized patients. The challenge is getting every single member of a hospital community—physicians, nurses, aides, technicians, housekeepers, patients, families and volunteers—to follow all infection control practices all the time.

Very young, very old, and very ill patients, especially those who have had invasive procedures, face the greatest infection risk. Once MRSA gets inside the body, it can disable and kill the young and healthy.

An all-out effort to fight the spread of infection take times and energy, but such initiatives save lives and money. Studies have shown a MRSA infection adds an average of 9.1 days to a patient's stay in hospital in the USA.

Every professional knows the importance of hand hygiene and environmental cleanliness but national studies have shown that compliance rates are alarmingly low.

## Myth Busting

APIC and other healthcare authorities recognize fighting MRSA is primarily dependent on cultural transformation rather than education or technological change. That means engaging the energy and resolve of every person who has any potential ability to spread germs or prevent transmission of infections. And that's just about everyone.

How is that possible? A change process called Positive Deviance offers one way to do it. PD builds on successful but unusual practices that are identified within a community or organization. It is based on the idea that in every group there are individuals whose uncommon, but demonstrably successful practices enable them to solve problems better than neighbours or colleagues who have exactly the same resources.

The story of PD's use to tackle the MRSA began in 2005 when Plexus Institute received a grant from The Robert Wood Johnson Foundation to launch a pioneering initiative with the Positive Deviance Initiative at Tufts University, the Centers for Disease Control and Prevention, the Delmarva Foundation and a network of six "Beta Site" hospitals. Promising results from the Beta Sites are demonstrating that it is possible to bust the MRSA myth.

- Billings Clinic reported an **84% drop in MRSA infections** from 2006 to 2008. Nancy Iversen, Director of infection control and patient safety for Billings Clinic says PD elicited unprecedented staff engagement in the fight against infection. "We're getting staff volunteers for things we never imagined..." she says. "As a healthcare professional who works to make hospitals safer, this is the most effective approach seen in a 23-year career."

- At Albert Einstein Medical Center, where five pilot units have been using PD, the surgical intensive care unit had no HA-MRSA infections in 2008, and the entire 550 bed hospital recorded a **35% reduction in MRSA infections** from 2006 – 2008. In 2007 Dr. Jerry Zuckerman, a hospital epidemiologist and Director of Infection at Albert Einstein observed, “We’ve made more progress on this in the last six months than we have in the last 14 years.”
- At the VA Pittsburgh Healthcare System, hospital wide **MRSA infections declined by 50%** from July 2005 to October 2006.

The other Beta Site hospitals, where promising reductions are also being experienced, are:

- Franklin Square Hospital Center
- Johns Hopkins Hospital
- University of Louisville Hospital

PD was pioneered in developing countries where its use led to lasting improvements in seemingly intractable challenges:

- Sustained 65% - 80% reduction in childhood malnutrition in communities with 2.2 million people in Viet Nam
- Sustained reduction in childhood malnutrition in 41 countries around the world
- Successful advocacy against female circumcision in Egypt, and thousands of genital mutilations averted
- Reduction in neo-natal mortality and morbidity in Pakistan and Viet Nam
- Increased condom use among commercial sex workers and intravenous drug users in Viet Nam, Burma and Indonesia
- 45% – 50% increase in student retention in schools in poor communities in Argentina and enhanced educational outcomes in US schools
- Documented reduction in girl trafficking in poor villages in East Java, Indonesia

The ***Harvard Business Review*** featured PD in its May 1, 2005 edition. Corporations are using the approach. Goldman Sachs used PD to change the behaviour and practice of its investment advisors. Hewlett Packard has applied PD to unusual technical challenges, and hospitals have begun to use PD to address quality improvement. A PD workshop was held at the January **2005 World Economic Forum** in Davos.

PD differs from expert-driven models for change. Like the human immune system, individuals and institutions reject what is perceived as “foreign matter”. The PD approach provides an antidote to the immune system defence: the problem and the solution share the same DNA. Change comes from the inside. People are engaged in the process of discovering successful practices and helping to spread them. In hospitals, thousands of people are

involved in hundreds of thousands of decisions and interactions. Those who impact patient care include physicians, nurses, aides, therapists, van drivers, housekeepers, technicians, executives, clerical staff, kitchen and food service workers, chaplains, visitors and families. And patients themselves.

*We are an intelligent species and the use of our intelligence quite properly gives us pleasure. In this respect the brain is like a muscle. When we think well, we feel good. Understanding is a kind of ecstasy.*

**Carl Sagan**

## CONFERENCE DESIGN

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The conference will feature an interactive design, enabling participants to learn in large and small groups about the PD process, experiences from the six Beta Sites, results achieved in MRSA reductions, and about topics and questions raised by those attending. Attendees will have the opportunity to:

- Hear the story of PD and its uses on challenging health issues around the world
- Interact with leaders and infection control staff from the Beta Sites hospitals and learn about their experiences using the PD process
- Learn about the results of the CDC's assessment of the impact of PD on MRSA rates in the participating hospitals from Kate Ellingson, PhD, a CDC authority of MRSA
- Take part in self-organized small group discussions on topics of special interest to conference participants
- Learn and practice core PD facilitation skills
- Build new relationships with those working on MRSA prevention and PD

## CONFERENCE FACULTY

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Curt Lindberg, Chief Learning and Science Officer, the Plexus Institute  
Kate Ellingson, PhD, epidemiologist at the Centers for Disease Control and Prevention (CDC)

David Hares, Director of Quality from Albert Einstein Medical Center - Pennsylvania

Michael Monaghan, DMan, PhD, Director of Science District, University College Dublin, and Trustee, Plexus Institute

Nicholas Wolter, MD, CEO at Billings Clinic, Montana

## INTENDED PARTICIPANTS

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The conference has been organized for: healthcare professionals searching for new methods to address challenging healthcare quality problems; people who are dedicated to eradicating MRSA and other healthcare acquired infections and who are looking for social change and improvement processes that can make this possible; healthcare professionals from hospitals, nursing homes, dialysis centers and outpatient facilities; healthcare leaders and infection control and quality improvement professionals; public health officials; and healthcare policy makers and funders. To make the most of this exceptional learning experience, participants are encouraged to attend with colleagues – those staff involved in preventing infections and improving quality and those senior leaders responsible for fostering and guiding improvement and patient safety work.

*Knowing is not enough; we must apply. Willing is not enough; we must do.*

**Goethe**

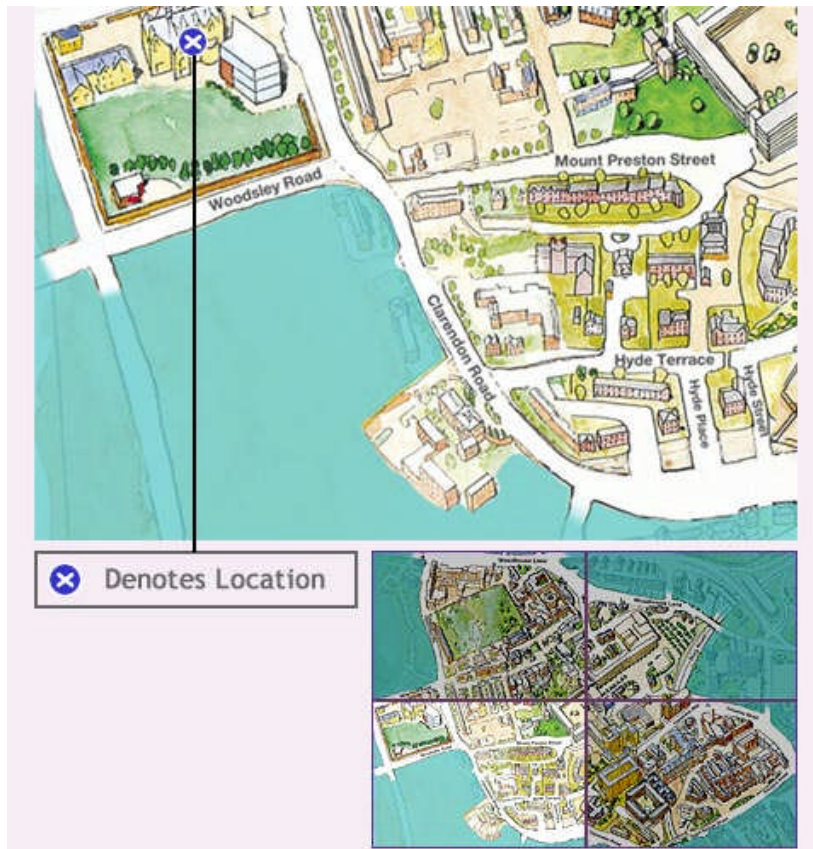
## DATES, TIMES AND LOCATION OF WORKSHOP

The conference will be held July 8<sup>th</sup> at the Charles Thakrah Building, next to Leeds University Business School, Leeds.

The conference will run from 9.00 am to 5:00pm

## TRAVEL AND LODGING

Leeds is a vibrant city with a full range of accommodation. We can offer accommodation in the University conference hotel, which is on the outskirts of Leeds, or can point you to hotels we like in the city.



**From the South (M1 Motorway):** At Junction 43 take the M621 towards Leeds. When the M621 splits, take the Manchester exit. \*Exit the M621 at junction 2, taking the A643 towards Wetherby. At the first roundabout take the third exit to city centre (A58). Continue on the A58(M) and take the A660 Skipton & Universities exit. Immediately take the left fork (A660), then turn right at traffic lights into Woodhouse Lane. Continue past the University on your left for 0.5 mile, then turn left at the traffic lights into Clarendon Road. Turn right into Moorland Road and the Business School is immediately on your left.

**From the West (M62):** Exit M62 at junction 27 to the M621. Continue from \* above.

**From the East (M62):** Exit M62 at junction 29 to the M1 Northbound. Immediately at junction 43 take the M621 towards Leeds. When the M621 splits, take the Manchester exit. Continue from\*

**From North (A1) and from York:** Leave A1 taking A64 towards Leeds and City Centre for several miles. In the City Centre, take exit to Skipton & University A660, which will bring you to Woodhouse Lane. Continue past the University on your left for 0.75 mile, and at the traffic lights turn left into Clarendon Road. Turn right into Moorland Road and the Business School is immediately on your left.

## **COSTS**

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For individual participation the fee is £300; for groups of 5 the fee is £1,200 (1 free place).

## **REGISTRATION AND CANCELLATION POLICY**

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To register, complete the registration form and return by email to [J.L.Paglia@lubs.leeds.ac.uk](mailto:J.L.Paglia@lubs.leeds.ac.uk). Registration fees cover tuition, conference materials, lunches, and break refreshments. Enrolment is limited, and early registration is advised. An email confirmation will be sent upon receipt of payment and completed registration form. Your registration fee, less a £50 administrative fee, will be refunded if CIHM receives written cancellation notice at least 14 days before the conference. No refunds will be made after that time.

## **ABOUT PLEXUS INSTITUTE**

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Plexus Institute is a community of diverse people – nurses, scientists, business executives, artists, educators, journalists, researchers, physicians, university students, and community leaders. Its mission is to foster the health of individuals, families, communities, organizations and our natural environment by helping people use concepts emerging from the new science of complexity. To learn more visit [www.PlexusInstitute.org](http://www.PlexusInstitute.org).

**Horacio David Hares, MD, MBA**, studied medicine in Argentina. He graduated from the University of Buenos Aires in 1996, and completed his training in internal medicine in 2001. He specialized in managed care and healthcare insurance in the Hospital Italiano, also in Buenos Aires, and then studied at the Ross School of Business, University of Michigan, where he earned a masters degree in business administration. Dr. Hares specializes in quality management in healthcare, with special emphasis in organizational transformations, change theories and Positive Deviance. He was one of the central figures in introducing PD into healthcare in the US through his work at Albert Einstein Medical Center, Philadelphia, where he facilitated a hospital-wide effort to reduce MRSA infections. As a facilitator he helps people to feel comfortable expressing their thoughts and opinions, and creating safe learning environments.

**Curt Lindberg, DMan, MHA**, has devoted a significant portion of his professional life to bringing complexity science insights to the fields of management and healthcare. He has accomplished this through his writing, speaking and by connecting complexity scientists, organizational and healthcare practitioners.

After serving as President of VHA of New Jersey, a network of nineteen hospitals, Curt helped found Plexus Institute where he now serves as Chief Learning and Science Officer. He co-authored, with Brenda Zimmerman and Paul Plsek, the first book devoted to complexity and healthcare: *Edgework: Insights From Complexity Science for Health Care Leaders*. More recently he co-edited the first book on complexity and nursing, *On the Edge: Nursing in the Age of Complexity*. In 2008 he was awarded a doctoral degree in complexity and organizational change from the University of Hertfordshire. He studied under Ralph Stacey, PhD. Lindberg also hold a masters degree in healthcare administration from The George Washington University. One of his current priorities involves introducing the social change process Positive Deviance into healthcare and public education, helping hospitals employ this process to prevent the transmission of the deadly pathogen MRSA and assisting inner city schools address intractable problems.

**Michael Monaghan, DMan, PhD**, graduated as veterinarian and after spending 4 years in practice he joined the Faculty of Veterinary Medicine at his *alma mater*, University College Dublin; he has spent the greater part of his career there. However, he has also worked on secondments at the University of Pennsylvania, Washington State University, University of Bristol and CSIRO Melbourne. He became Dean of the Faculty in 1996 and implemented an ambitious change agenda including radical overhaul of the curriculum, acquisition of the funds for a new veterinary school and supervision of the design and construction of the school which was completed in 2002. He chaired the Expert Advisory Group on Foot and Mouth Disease for the Minister for Agriculture in 2001 and fulfilled a similar role with regard to Avian Influenza in 2006. He has been involved in numerous quality reviews of

university departments in Ireland, Estonia and Australia and a number of these assignments have resulted in major changes in the organisations.

Currently, he is director of a large programme (€350 million) for re-development of the science district at UCD. He became fascinated by the processes of change in universities and, in 2008, this interest led to the award of a doctorate in management from the University of Hertfordshire, Complexity and Management Centre. This work has also resulted in a number of invitations to speak at academic conferences on organisational change as it affects the university. Michael currently serves on the Board of Trustees of Plexus Institute.

**Nicholas Wolter, M.D.**, is CEO of Billings Clinic, based in Billings, Montana, a fully integrated health system in the northern intermountain Rocky Mountain states. Billings Clinic is a charitable, tax-exempt medical foundation, employing over 3,000 people to support and operate a 225 physician group practice, a 272 bed hospital, 90 bed nursing home, and a Research Center. Billings Clinic provides physician clinic services in multiple rural sites and also manages six rural critical access hospitals. Billings Clinic has focused its core strategy on improvements and outstanding performance in the areas of patient safety, quality, and service to patients and their families.

Dr. Wolter serves as a member of the Board of Directors of the American Hospital Association (AHA) and filled two terms as a Commissioner on the Medicare Payment Advisory Commission. Dr. Wolter is a former Chairman of the Board of VHA Mountain States. In 2001 he helped found Plexus Institute. In 2004, Dr. Wolter was recognized by the Medical Group Management Association as Physician Executive of the Year.

Dr. Wolter received his BA in English at Carleton College, his MA in American Culture at the University of Michigan, and his M.D. at the University of Michigan. He completed his internship and residency in Internal Medicine and a fellowship in Pulmonary and Critical Care Medicine. He is board certified in Internal Medicine and Pulmonary Medicine.

Dr. Wolter played a key role in introducing Positive Deviance into healthcare in the United States. Billings Clinic was partner in the first significant application of Positive Deviance in the country. The focus was MRSA prevention.

**Kate Ellingson**, PhD, is an epidemiologist at the Centers for Disease Control and Prevention in the Division of Healthcare Quality Promotion. After receiving her doctorate in epidemiology and public health from Yale University, she began her CDC career in 2006 in the Epidemic Intelligence Service, where she spent two years investigating the transmission of infectious pathogens in healthcare settings and evaluating prevention initiatives designed to reduce such infections. She has worked on several projects specific to Methicillin-Resistant *Staphylococcus aureus* (MRSA), including an evaluation of an initiative to reduce MRSA transmission in VA hospitals, an assessment of antimicrobial resistance on the US-Mexico

border, and a policy analysis of a state mandate for public reporting of hospital-associated MRSA infections.

She led the research effort to evaluate the effectiveness of a Positive Deviance guided MRSA prevention initiative. The results of the research were presented in March 2009 at the Society for Healthcare Epidemiology of America in a presentation entitled “A Successful Multi-Center Intervention to Prevent Transmission of Methicillin-resistant *Staphylococcus aureus* (MRSA).”

Dr. Ellingson has worked internationally in Kenya and Uganda to build infection control capacity and reduce amplification of outbreaks in East African hospitals. She has also led domestic investigations into quality of care for dialysis patients and for transfusion and transplant recipients. Her current position emphasizes quantitative statistical analysis and the translation of CDC-guidelines into feasible practices.



## A Successful Multi-Center Intervention to Prevent Transmission of Methicillin-resistant *Staphylococcus aureus* (MRSA)

**Background:** Reports of successful multicenter interventions to reduce endemic antimicrobial resistance problems among U.S. hospitals are rare. In 2006, three hospitals (Billings Clinic, Billings, MT; Albert Einstein Medical Center, Philadelphia, PA; and University of Louisville Hospital, Louisville, KY) partnered with the Plexus Institute and the Centers for Disease Control and Prevention to implement a hospital-based intervention to prevent MRSA transmission and share electronic data for objective evaluation of the intervention.

**Objective:** To analyze the impact of a multicenter intervention to prevent MRSA transmission in hospitals.

**Methods:** The intervention, introduced simultaneously in all hospitals in early 2007, consisted of: 1) active surveillance testing for MRSA in selected intensive care units, 2) Contact Precautions for MRSA carriers, 3) hand hygiene promotion, and 4) Positive Deviance, a social change process that engages staff in using existing resources to solve problems collaboratively. No routine attempts to suppress MRSA colonization were used. Clinical microbiology results for all inpatient areas generated between 1/1/2005 and 9/30/2008 were electronically extracted from the laboratory information systems in each hospital. MRSA cases were defined by positive clinical (non-surveillance) cultures from patients with no MRSA-positive cultures in the previous year. Monthly hospital-wide MRSA incidence densities, and monthly proportions of *S. aureus* resistance to methicillin, were modeled for each hospital using interrupted time series (ITS) regression analyses; overall impact across hospitals was estimated by pooling individual model estimates using inverse variance-weighting.

**Results:** Accounting for pre-intervention trends, ITS analyses revealed a significant intervention-associated reduction in MRSA incidence density across the three hospitals ( $p=0.0008$  for pooled effect). In the 20-month post-intervention period, each hospital demonstrated significant reductions in MRSA incidence density (by 26%, 31%, and 62%;  $p<0.0001$  for pooled trend). There was a trend towards intervention-associated reduction in methicillin resistance across hospitals that did not reach statistical significance ( $p=.11$  for pooled effect), but reductions in methicillin resistance were noted in the post-intervention period at each hospital (by 7%, 15%, and 28%;  $p=0.02$  for pooled trend).

**Conclusions:** Successful implementation of a multifaceted MRSA prevention program using a novel approach to social and behavioural change resulted in a significant reduction in pooled MRSA incidence, with sustained decreases demonstrated over time; results also suggest post-intervention improvement in the *S. aureus* antibiogram. These results were achieved without the use of hospital-wide active surveillance or MRSA decolonization strategies.

Katherine Ellingson, PhD<sup>1</sup>, Nancy Iversen, BSN, RN, CIC<sup>2</sup>, Jerry M. Zuckerman MD<sup>3</sup>, Dorothy Borton, RN, BSN, CIC<sup>3</sup>, Linda Goss MSN, RN CIC<sup>4</sup>, Kay Lloyd<sup>4</sup>, Pei-Jean Chang, MPH<sup>1</sup>, John Stelling, MD<sup>5</sup>, Alex Kallen, MD<sup>1</sup>, Monique Sternin<sup>6</sup>, Curt Lindberg, DMan<sup>7</sup>, Jon C. Lloyd, MD<sup>7</sup>, Margaret Toth, MD, John A. Jernigan, MD, MS<sup>1</sup>, for the Positive Deviance MRSA Prevention Partnership.

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