

# Redesigning Hospital Care to Reduce MRSA : Collaboratives Using Positive Deviance, & Lean

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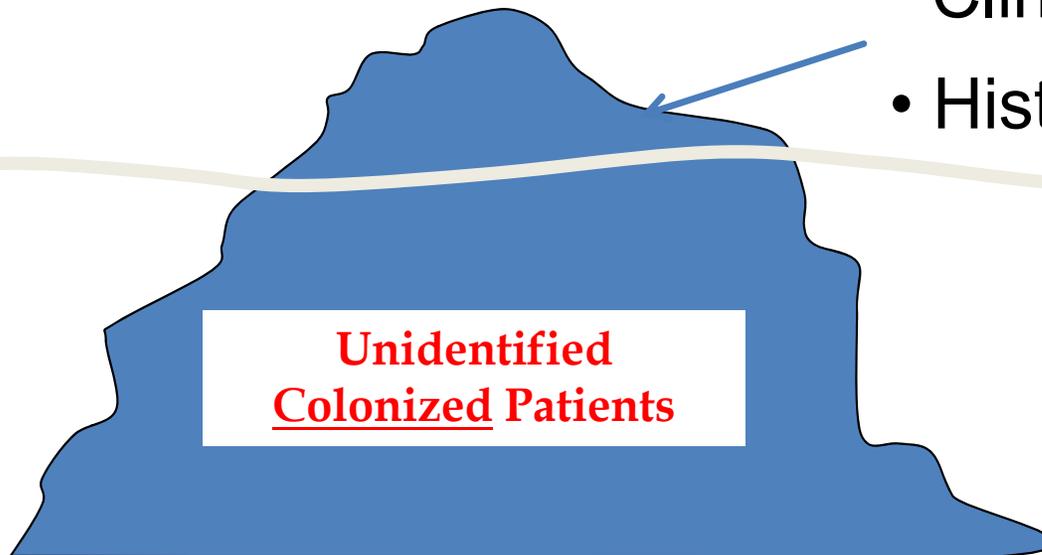
# Acknowledgements

- ❑ Funding from AHRQ
  - ❑ Testing Techniques to Radically Reduce Antibiotic Resistant Bacteria HHS A2902006000131 (Completed)
  - ❑ Healthcare Associated Infections (HAI) Initiative Assessment Program HHS A2902006000131 (Current)
  - ❑ Implementing and Improving the Integration of Decision Support into Outpatient Clinical
  
- ❑ Funding from AHRQ and CDC
  - ❑ Testing Spread and Implementation of Novel MRSA-Reducing Practices HHS A290200600013 (Current)
- ❑ Thanks to our collaborators, partners, providers, patients!

# Reservoir for the Spread of Antibiotic Resistant Pathogens

- **Colonized patients, NOT just infected patients,** can transmit AR pathogens to healthcare workers and other patients.

Clinical Cultures +  
• History of MRSA



# Efficacy of Preventive Interventions

- ▣ Large body of consistent evidence that control is highly cost effective (Gould 2006)
- ▣ Organizational Change initiatives (Lean, PD) effective reductions of MRSA 50-85% (Pittsburg, Indy, RWJ Beta 2008-9)
- ▣ Active interventions to eliminate MRSA transmission shown to save money and lives (van Rijen & Kluytmans, 2009)
- ▣ Innovative approaches to engage hospital staff to intervene and improve healthcare processes effective in reducing MRSA (Cooper 2005)
- ▣ External pressure on hospitals to implement universal active MRSA surveillance. Several states and the VA mandated screening (Graham, 2007)

# Regional Collaboratives-

- Indianapolis has unique health information exchange (RHIO)
  - Indiana Network for Patient Care (INPC)
  - Includes nearly all of the healthcare systems in Indianapolis
  - Spans >95% of all of the inpatient care in the city, expanding regionally.
- The five competing health care systems share electronic information with INPC on their patients, to ensure safe and quality health care.

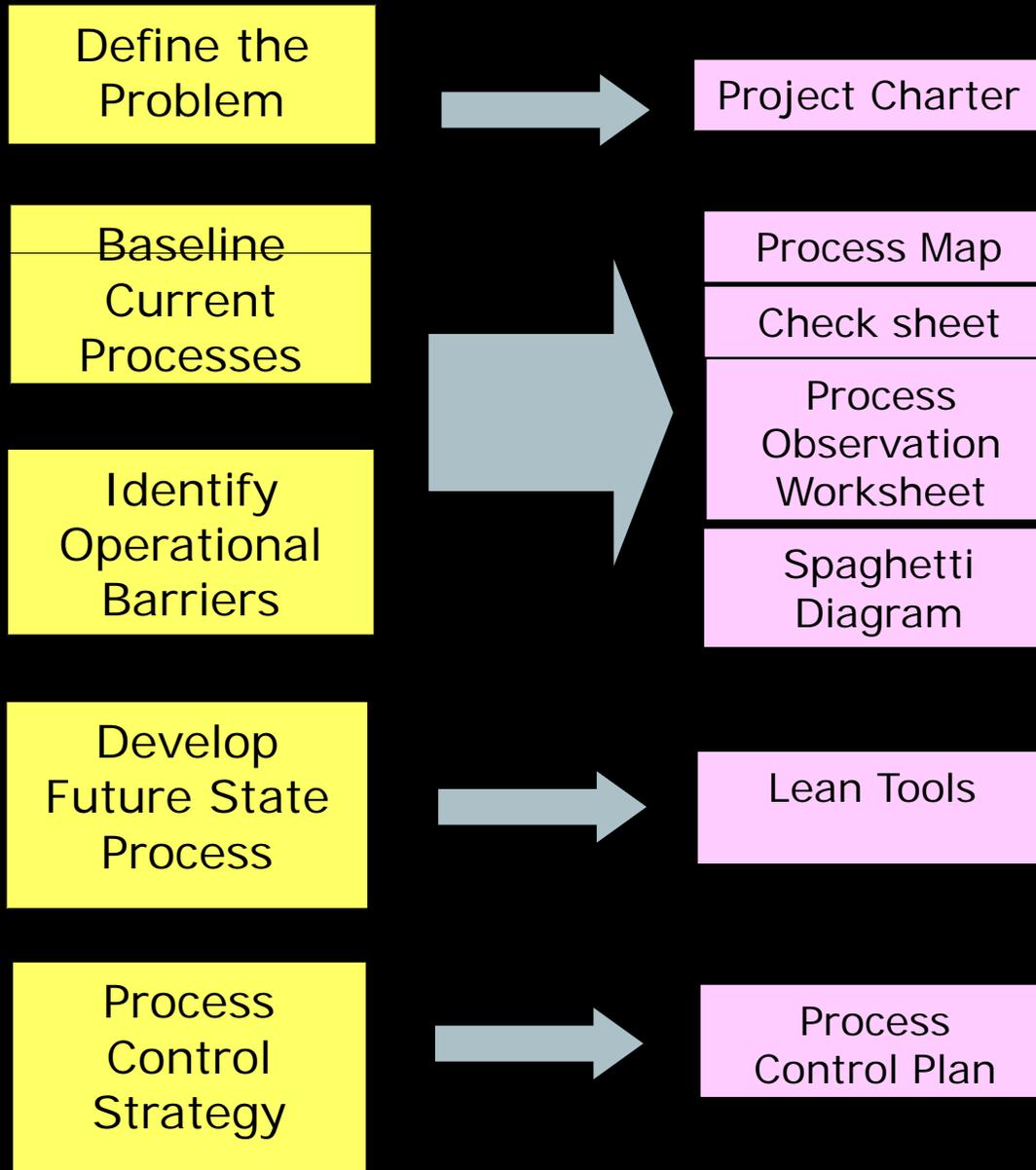
# MRSA Phase One

- ▣ AHRQ funded proposal to reduce MRSA in hospitals over 18 months through the ACTION collaborative funding mechanism
- ▣ Our interventions were based on the Pittsburgh VAMC bundle, using lean, organizational change and informatics (data exchange, reporting):
  - Conduct active surveillance of all incoming pts. in ICUs
  - Improve rates of contact isolation
  - Improve hand hygiene rates
  - Organizational change
  - Environmental decontamination

# MRSA Phase One

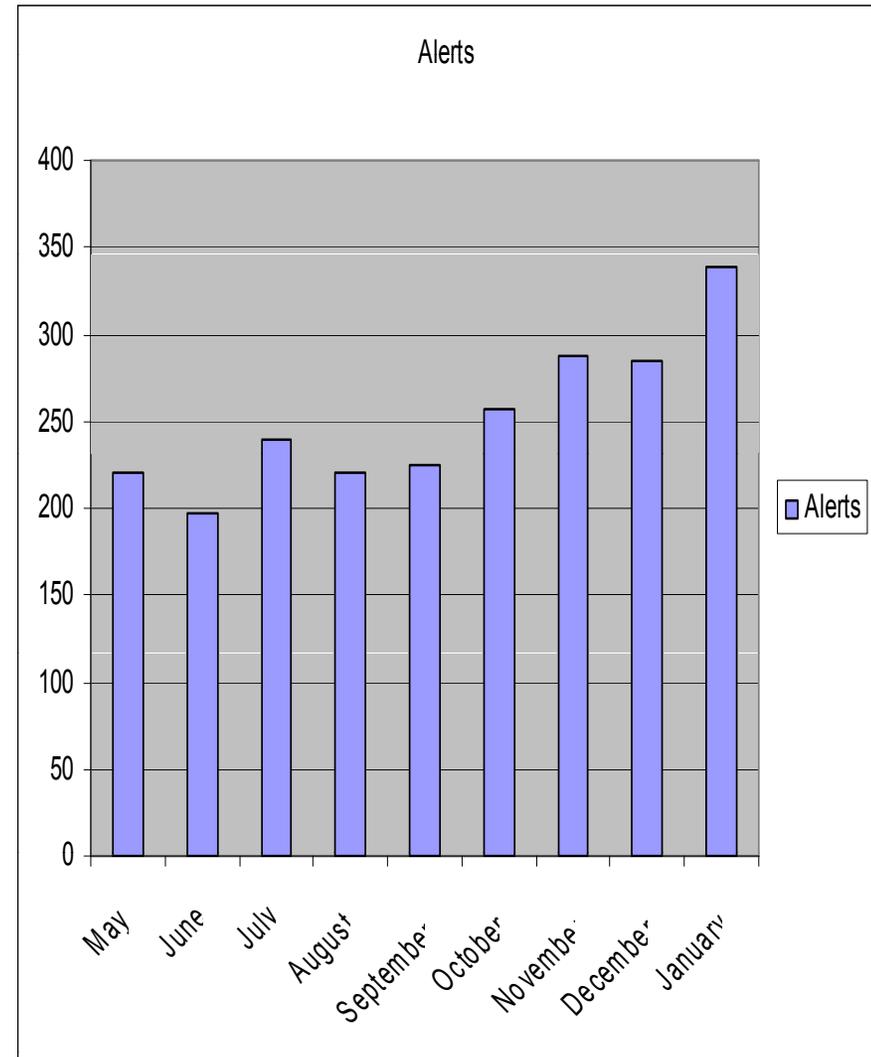
- Our health care engineers partnered with and trained front-line workers to use lean and positive deviance approaches
- Focused on sharing evidence and methods, coaching front-line staff teams to lead instituting systems changes to systematize processes and sustain practices.
- Regular measurement and feedback of adherence to enhance adoption.
- Weekly huddle of all hospital teams to identify barriers & facilitators, review and reinforce progress, share best practices, strategize about spread and solutions.
- Collaboration teleconferences

# Lean Tools



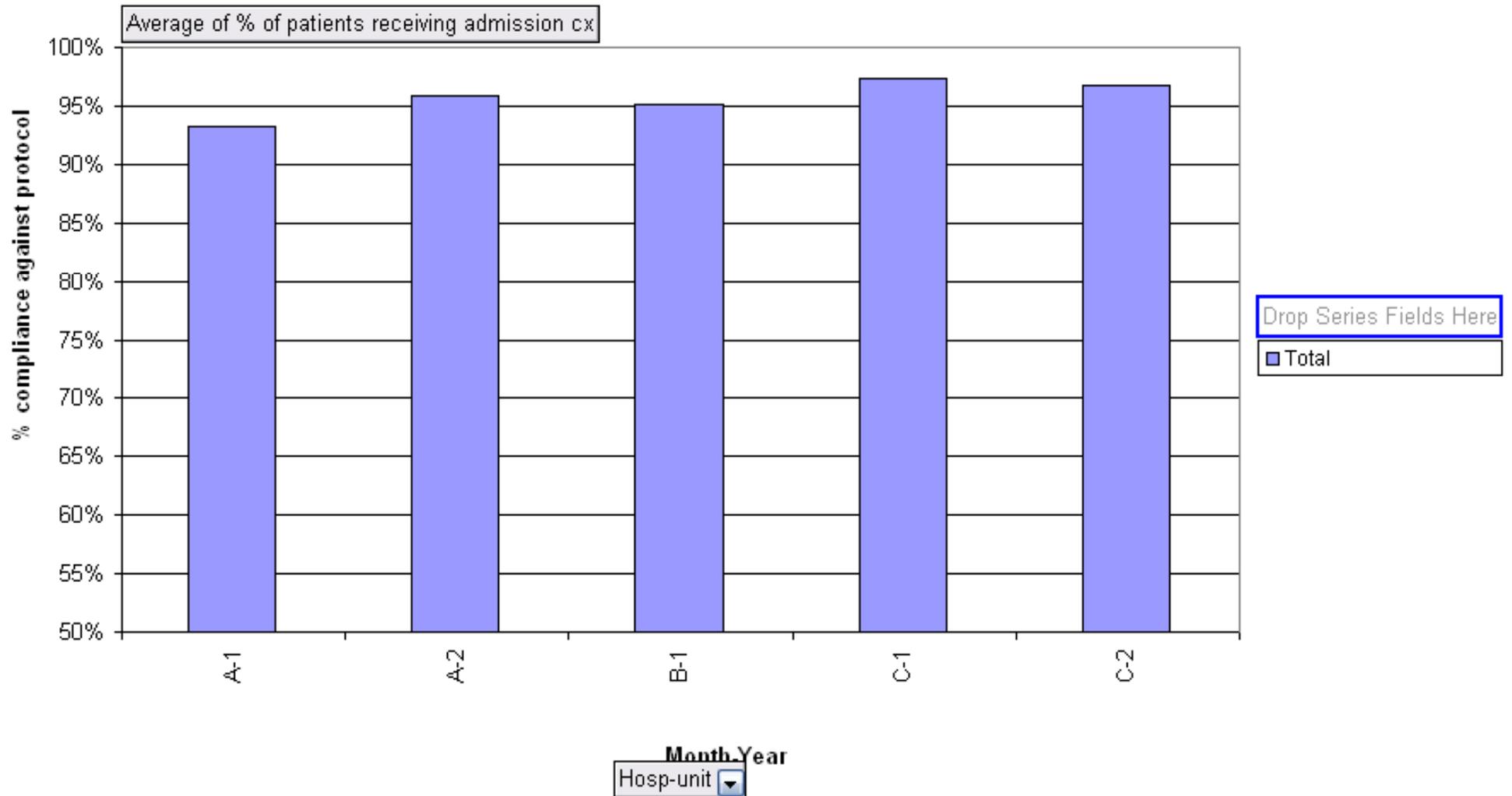
## Operational Citywide Electronic Infection Control Network: Results from 1st Year

- ▣ *Infection control is a regional problem, requiring a coordinated effort*
- ▣ *Created a citywide electronic notification system to prospectively track all known patients with MRSA*
- ▣ *Currently track 17,000 patients with a history of MRSA infection or colonization across Indianapolis.*
- ▣ *Since May 2007, delivered 2698 admission alerts on patients with a history of MRSA, 19 percent based on data from another institution.*
- ▣ *20 infection control providers (ICPs) spanning 16 hospital*



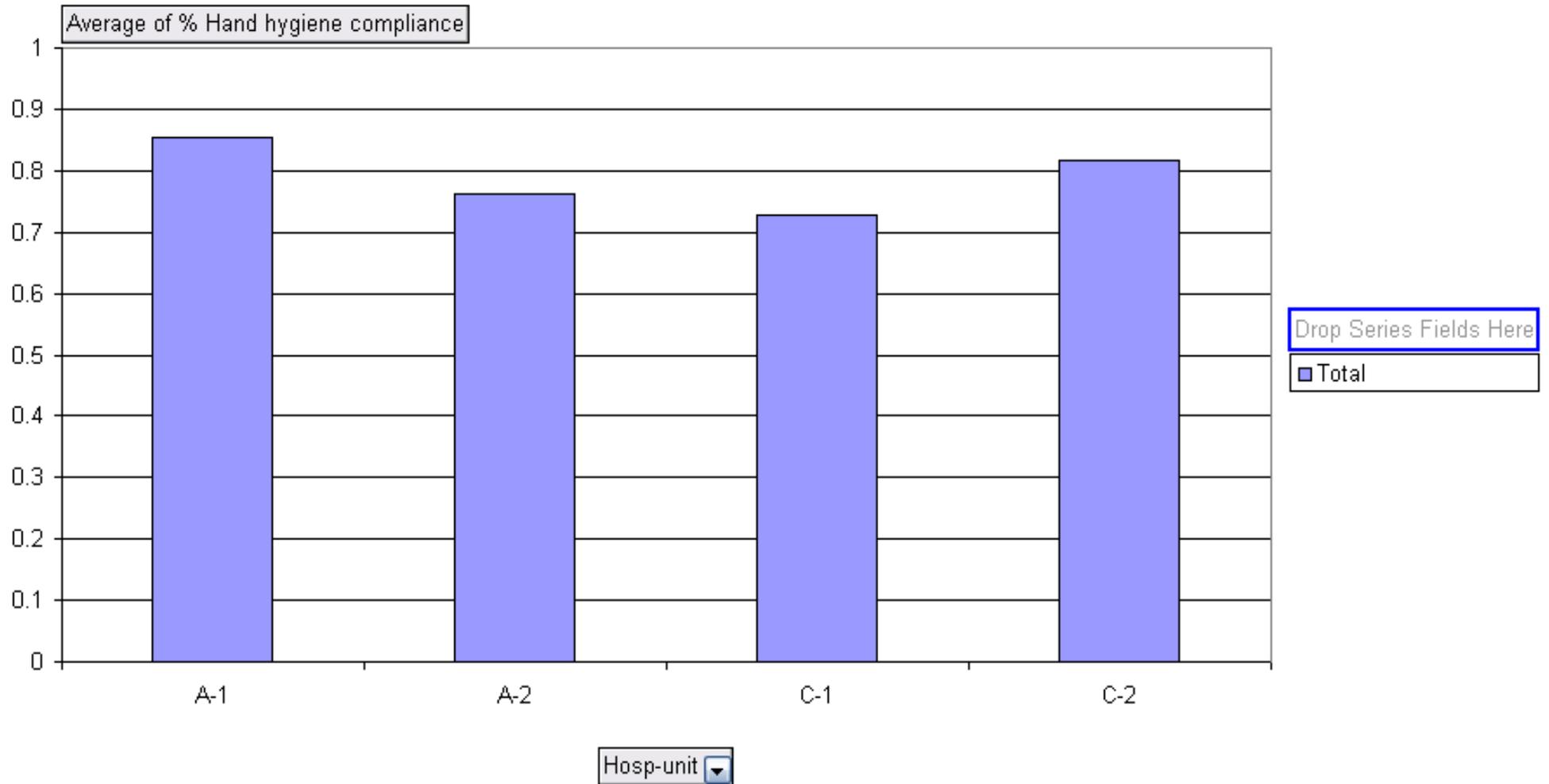
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### Admission Culture Compliance for Study Units (1/08-12/08)



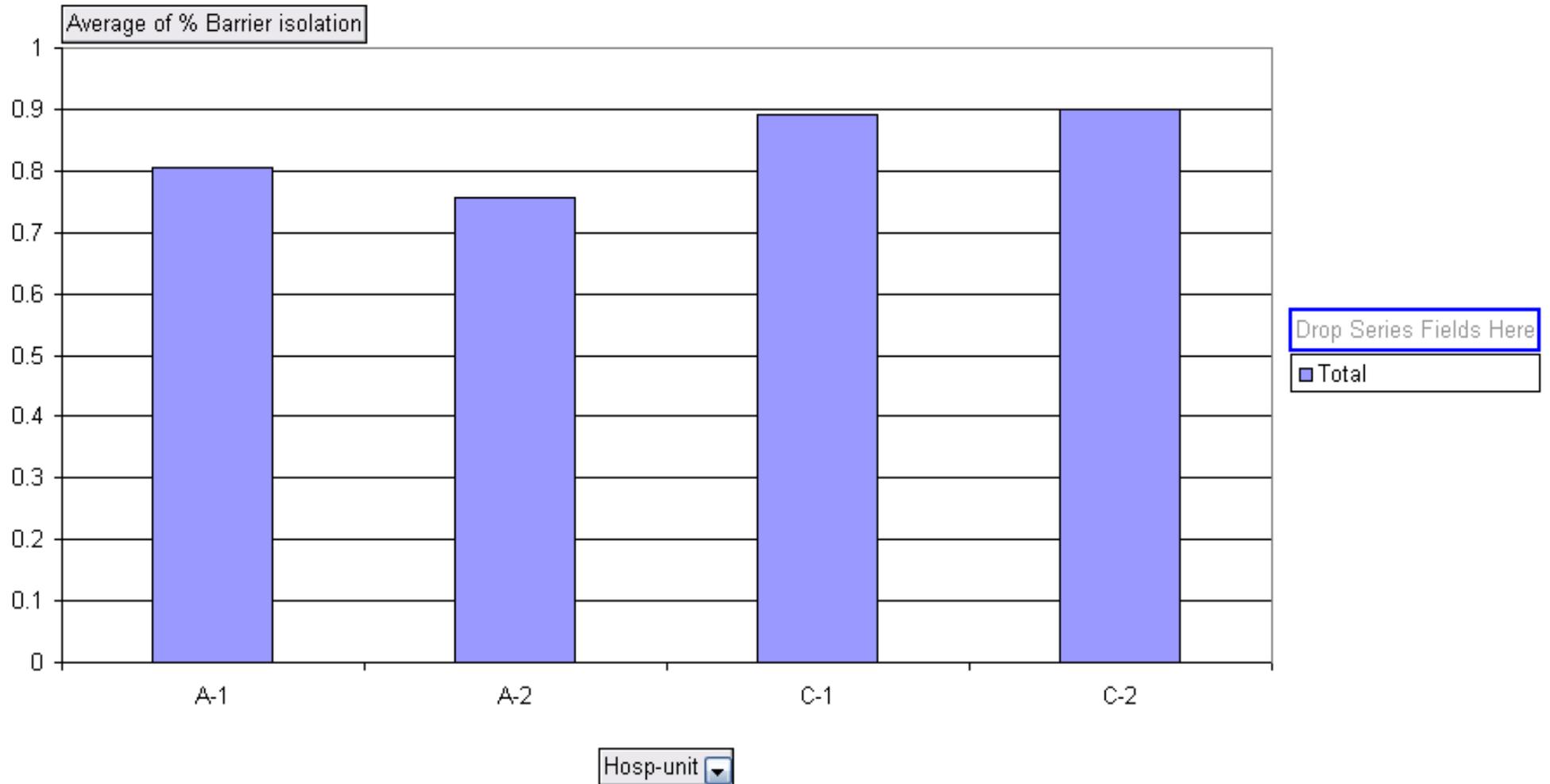
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## Hand Hygiene Compliance for Study Units (1/08-12/08)



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## Contact Isolation Compliance for Study Units (1/08-12/08)



# MRSA Phase One Results

- ▣ Significant improvement in process measure adherence to 80->95%
- ▣ Pre and post intervention results for first three hospitals mean of 60% reduction on study units over 9-12 months
- ▣ ~ 20% reduction MRSA infections hospital wide
- ▣ Reduction in level of MRSA among *S. aureus* (4<sup>th</sup> hospital)
- ▣ Reduction in associated BSIs and UTIs (4<sup>th</sup> hospital)
  
- ▣ Presented at Academy Health, AHRQ and AMIA 2008, 2009

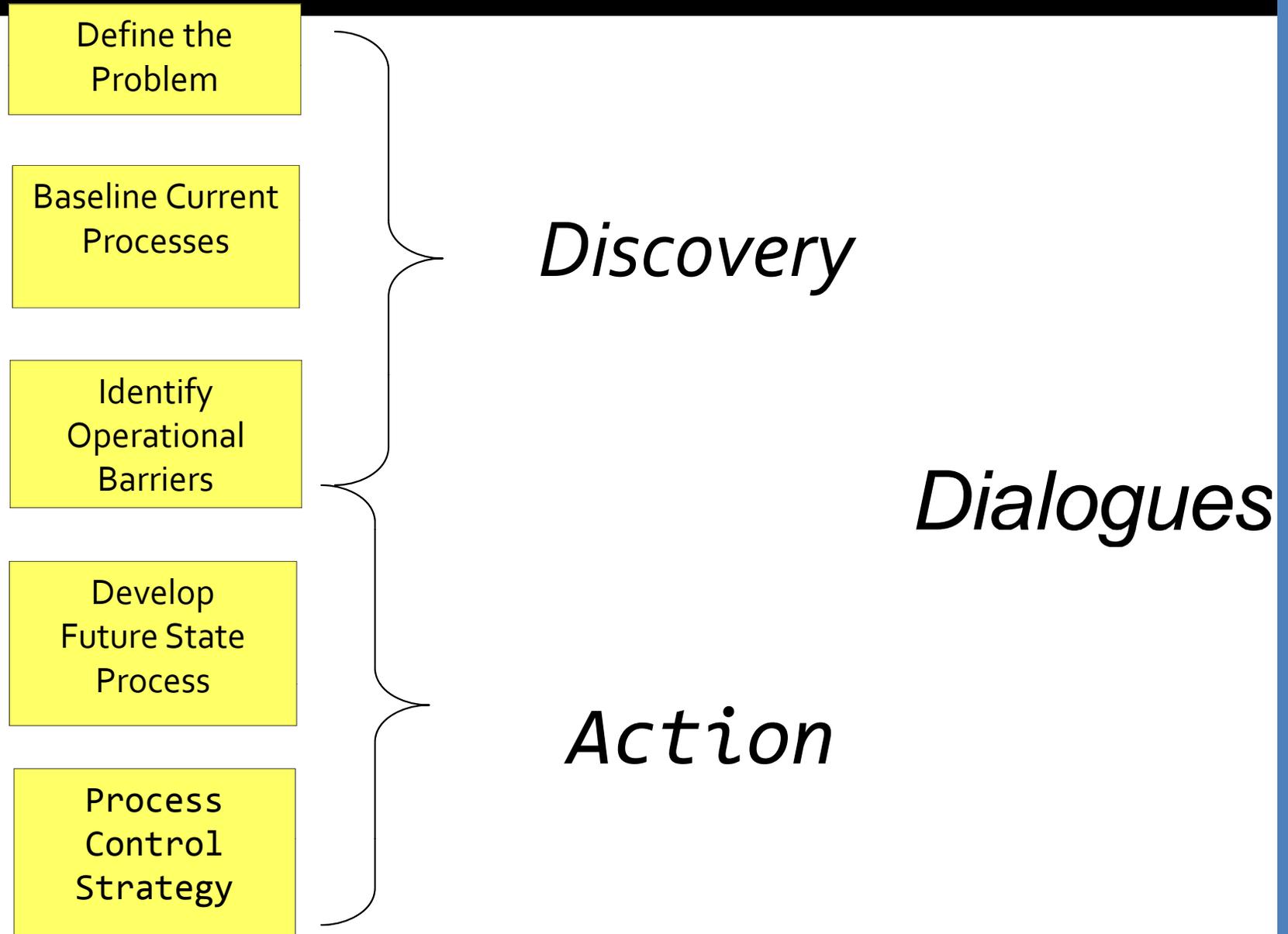
# MRSA Phase Two

- Spreading the successful intervention of Phase One to more units in Indianapolis
- Recruited 4 Indy and 3 other hospital systems
  - University Health Network, Toronto, Ontario
  - St. Patrick's Health, Missoula, Montana
  - Maine Medical System, Providence, Maine
- Training and Coaching Using Experienced Integrated Positive Deviance with Lean Coaches

# MRSA Phase Two

- ▣ What is Positive Deviance?
- ▣ Technique to engage front line staff in owning & improving processes and sustaining change
- ▣ Based on identification of practices of used by 'positively deviant' staff/departments
- ▣ Critical for staff involvement/**buy-in**

# Integrated Lean/PD approach



# Discovery and Action Dialogues

- Informal meetings held with front line staff to discuss the current status of the process
- Incorporate as much front line staff as possible
- The goal is to 'discover' the issues and potential solutions and then take 'action' as rapidly as possible.
- It is easier to  
than to "*think your way into a new way to acting*"

# MRSA Phase Two

- What's different in Phase Two besides spread to new systems?
- Learning Collaborative: Teams from hospitals connect with teams from other hospitals employing the MRSA Intervention Bundle to foster learning and innovation.
- More extensive activities to train interdisciplinary teams within each of the participating health systems.

# MRSA Phase Two- Challenges

- ▣ Leadership engagement critical in times of financial and H1N1 challenges
- ▣ Data collection for research rigor may be too intensive for most community hospitals
- ▣ Hospitals need and desire regular feedback on impact of interventions
- ▣ Need a better electronic data collection infrastructure relating to displaying intervention success (outcome data)
- ▣ Need better solutions to support long-distance collaboration, coaching, mentoring
- ▣ Need new mechanisms for academic achievement, paper writing, publishing of redesign papers, new journals, new toolkits

# MRSA Phase Two – Lessons Learned

- System redesign approach of training, consultation and coaching front-line staff seems to be strong, sustained approach
- Importance of buy-in from highest institutional levels crucial
- Enthusiasm builds from within because redesign teams own it!
- Informatics tool helpful in identifying great cross-over of MRSA patients in hospitals

# Conclusions from other recent AHRQ Work

- Hospital Acquired Infections Collaboratory has identified many important barriers, facilitators and positive deviant practices to reduce HAIs!
- Usability assessments, including ethnographic observation, structured interviews and usability testing of prototypes valuable for improving CDS!  
--see Haggstrom et al, Saleem et al at AMIA 2009

# HAI: Barriers & Challenges to Infection Prevention at the Point of Care

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AHRQ Hospital Acquired Infections Collaborative  
July 13 and 14th, 2009  
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# Key Barriers

- Problems when leadership support is MIA, naivete' about resource requirements
- Challenges of unanticipated change (turnover of residents, champions in units, nursing staffing, redesign of units, new information system)
- Demonstrating cost effectiveness, limited additional funds
- Competing priorities, level of required documentation in daily work
- Use and documentation of bundle variables inconsistent- Real time data collection, burden of reporting
- Availability of time, staff and effective approaches for training
- Need to convince professionals EBPs are beneficial to them and their patients—given limited time
- Mix of hospitals (large, small) and unique challenges (surveillance) of a small rural community, non-profit hospital
- Evolve guidelines based on developing evidence.
- Time, persistence and structured communication needed for practice/culture change to take hold.
- Involving key stakeholders (unit champions, front-line) integrating into the unit

# Key Facilitators

- Teamwork Crucial (the leader isn't always in the front (bicycle racing team))
- Mechanism to provide staff with strong evidence-base
- Communicate expectations and require accountability
- Do what works locally—ability to adapt to local context
- Promise of providing back data one of greatest motivators.
- Strong physician and nurse leadership and champions
- IT develops an electronic checklist (data warehouse) to allow data queries and feedback compliance on process measures
- Top executives make rounds and solve problems
- Mandatory state reporting (NHSN) and changes in CMS reimbursement
- Leadership support results in sufficient time for front-line staff to improve processes, change systems and achieve success
- Communication, involvement of front-line staff imperative
- celebrating the successes

# Lessons Learned/Positive Deviants

- Developing implementation plans, audit tools, assess sustained translation of prevention interventions in clinical practice.
- Identify current practices, opportunities and action plans for improvement
- Utilize strengths of individuals to motivate and sustain changes in behaviors—nurses really want to train younger nurses and mentor
- Need to use strength and experiences of champions key to implementing and sustaining changes over time
- Use multiple venues to raise awareness and reinforce practice (start with medical leadership, then staff, getting board involved, posting BSI rates in bathrooms)
- Compare performance in a meaningful way
- Start small (at unit level, make it work, easy success begets success, then spread)
- Collect limited data that is most relevant to showing impact of interventions
- Data collection needs to have face validity with clinicians and be timely

# Lessons Learned/“Positive Deviants”

- Program for nurses in TRIP, reviewing evidence , coaching TRIP project, write a manuscript (Titler)
- Once physician (ICU) unit leadership adopts goals to be the best in hand hygiene for the hospital—strong driver of change
- Regularly (daily) measuring and feeding back hand hygiene at unit level really reinforces adherence
- Nurses encouraged by manager and ICU directors to “call out” non-adherence and teasing/cajoling low adherence providers
- Advanced Practice Institute provides training in implementing EBP, critique of CPGs, and hospital-specific action plans
- IT develops an electronic checklist whenever central line inserted to track denominators (data warehouse) for data queries and feedback compliance to units
- After eliminating BSIs for a year in intervention unit, then every subsequent BSI is reviewed and discussed by an interdisciplinary team
- Integrating checklists into work rounds, electronic systems is effective
- Multiple champions, staff engagement helps overcome turnover in project leadership