

# Multidrug-Resistant Organisms: An Innovative Approach to Preventing Healthcare Transmission

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## INTRODUCTION

### Project Description

Incidence and prevalence of antibiotic resistant organisms such as *Klebsiella pneumoniae Carbapenemase* (KPC), *Clostridium difficile* (C. diff) and Methicillin Resistant *Staphylococcus aureus* (MRSA) are on the rise in healthcare environments. Infection Prevention (IP) at a community Magnet hospital recognized a new point of risk after our first KPC positive patient was admitted and identified during surveillance in early 2011. Upon investigation, it was determined that additional precautionary measures would need to be developed to prevent transmission of this highly resistant organism. A Multi-Drug Resistant Organisms (MDRO) Prevention Team was formed to address patient care issues related to these organisms.

The efforts of the multidisciplinary MDRO Prevention Team were focused on improving surveillance and preventing transmission. The team created a "C. diff bundle." The bundle includes placement of a small rolling cart for soiled linen with attached bleach-based disinfectant wipes in each contact enteric isolation room. The team implemented a new isolation category for highly resistant organisms. These patients are placed on "Strict Contact Isolation". The major differences in Contact versus Strict Contact include using dedicated single-use equipment, minimizing patient transfers, and following specific cleaning requirements. Infection prevention and the MDRO Prevention Team collaborated to educate administration, clinical staff, medical staff and Environmental Services (EVS) staff about highly resistant microorganisms and transmission prevention.

### Project Aims

The multidisciplinary MDRO team set a goal of decreasing healthcare-associated MRSA and C. diff transmission by 25% and maintaining zero healthcare-associated KPC transmission.

## MULTIDISCIPLINARY TEAM

### Inpatient Units

- Sandra Beckler, CCU Patient Care Coordinator
- Joelle Calloway, Medical Resource Coordinator
- Misty Oxentine, Clinical Development Coordinator
- Casey Mueller, Ortho Patient Care Coordinator
- Andrea Flynn, Clinical Development Coordinator

### Infection Prevention & Performance Improvement

- Michelle Mace, Infection Prevention Administrator
- Alisa Leonard, Infection Prevention Coordinator
- Lisa Wike, Performance Improvement Director

### Pharmacy & Environmental Services

- Gary Smith, Clinical Pharmacist
- Mari Lynn Sain, Pharmacy Technician
- Frida Sigmon, EVS Director

### ED & Surgical Suite

- Danielle Thurman, ED Patient Care Coordinator
- Holly Conner, OR Clinical Development Coordinator
- Jackie Miller, Day Surgery & PACU Director

## MEASURES

- Healthcare-associated (HA) and community-acquired (CA) infections
  - Number of HA & CA MRSA infections
  - Number of HA & CA C. diff infections
  - Number of HA & CA KPC infections
  - Infection rate = (# infections / # patient days) x 1000
- Environmental Services Discharge Cleaning Accuracy
  - Measured by ultraviolet light evaluation

## CHANGES IMPLEMENTED FOR ALL MDRO

### Deep Dive Process

- Interdisciplinary team meets when a healthcare-associated infection is identified
- Team investigates all aspects of patient care for contributing factors
- Team develops a list of process improvement opportunities and/or policy updates
- Lessons learned are utilized as educational opportunities and communicated to staff

### Real-Time Alerts

- Automatic real-time alerts delivered via email to Infection Preventionists and Infectious Disease Physicians
- Allows for immediate intervention for highly resistant organisms

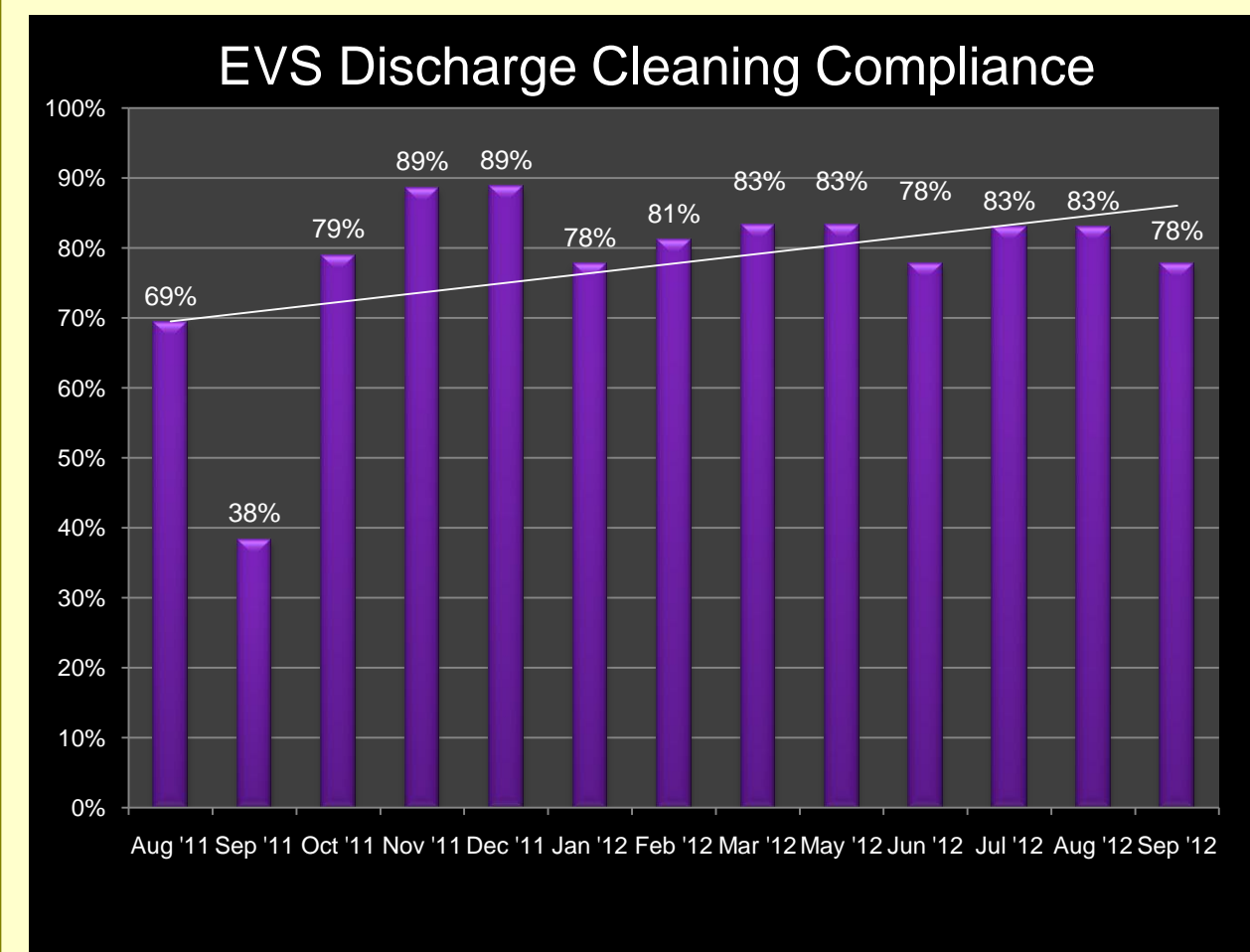
Catawba Valley Medical Center  
Date: 2012-05-04

You have 1 new Real Time alert(s) on the SafetySurveillor site:

Real Time Event(s)	Occurrences
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Please go to the [SafetySurveillor](#) site.

## MDRO ENVIRONMENTAL CHANGES IMPLEMENTED



- Discharge room cleaning evaluated by GlowGerm™ and ultraviolet light
- 6 locations in each room assessed and evaluated by EVS Director
- With staff education, compliance increased from 60% in June 2011 to 78% or greater for months to date in 2012

## KPC-SPECIFIC CHANGES IMPLEMENTED

Visitors must report to Nursing Station before entering.

- ✓ Perform hand hygiene before entering and before leaving room.
- ✓ Wear gloves when entering room or cubicle, and when touching patient's intact skin, surfaces, or items in room.
- ✓ Wear gown when entering room or cubicle.
- ✓ Use patient-dedicated or single-use disposable equipment or clean and disinfect shared equip (BP cuff, thermometers) between patients.
- ✓ Clean room thoroughly. Leave patient in same room if at all possible. EVS to clean room twice at discharge. Nursing staff to use Cavivipes to wipe high-touch surfaces once per shift.

**PRECAUCIONES DE CONTACTO**  
Los visitantes deben presentarse primero al puesto de enfermería antes de entrar. Lávese las manos. Póngase guantes al entrar al cuarto.

### Strict Contact Isolation

- Used for positive or suspected KPC patients
- Ventilated patients from nursing homes are screened for KPC (rectally) and placed on strict contact isolation, until screening is resulted
- KPC positive patients readmitted within 12 months are placed on strict contact isolation and are not rescreened
- Interventions include
  - Patient dedicated single-use equipment
  - Minimal patient transfer
  - Daily cleaning of surfaces
  - Discharge cleaning completed twice by different EVS staff

## C. DIFF-SPECIFIC CHANGES IMPLEMENTED



### C. diff Cart

- Placed in room of patients on Contact Enteric Isolation
- Rolling cart with linen bag to facilitate containment of soiled linen
- Bleach-based disinfectant wipes attached in pocket on back of cart for convenient cleaning
- Upon discharge, EVS cleans patient room and cart with bleach-based product

### Contact Enteric Isolation

- Used for patients who are C. diff positive or present with symptoms of C. diff
- C. diff positive patients remain on isolation for entire hospital stay
- Interventions include
  - Place C. diff cart in room
  - Patient dedicated single-use equipment
  - Preferred patient placement in rooms with anterooms and additional sink for convenient soap and water hand hygiene

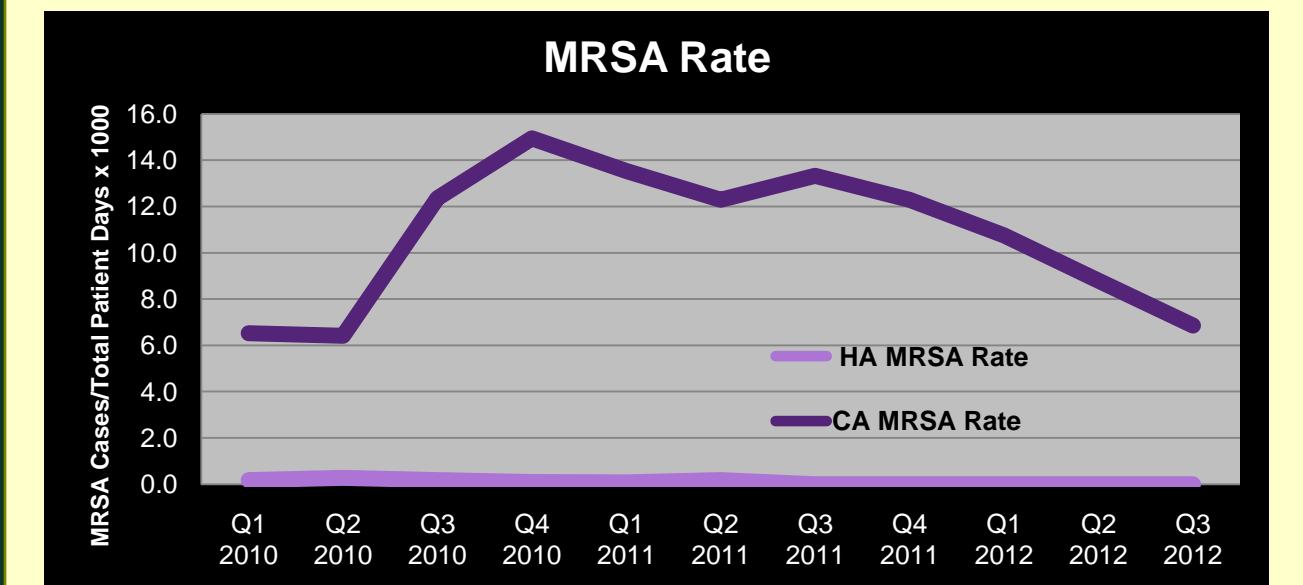
Visitors must report to Nursing Station before entering.

**SPECIAL ENTERIC**

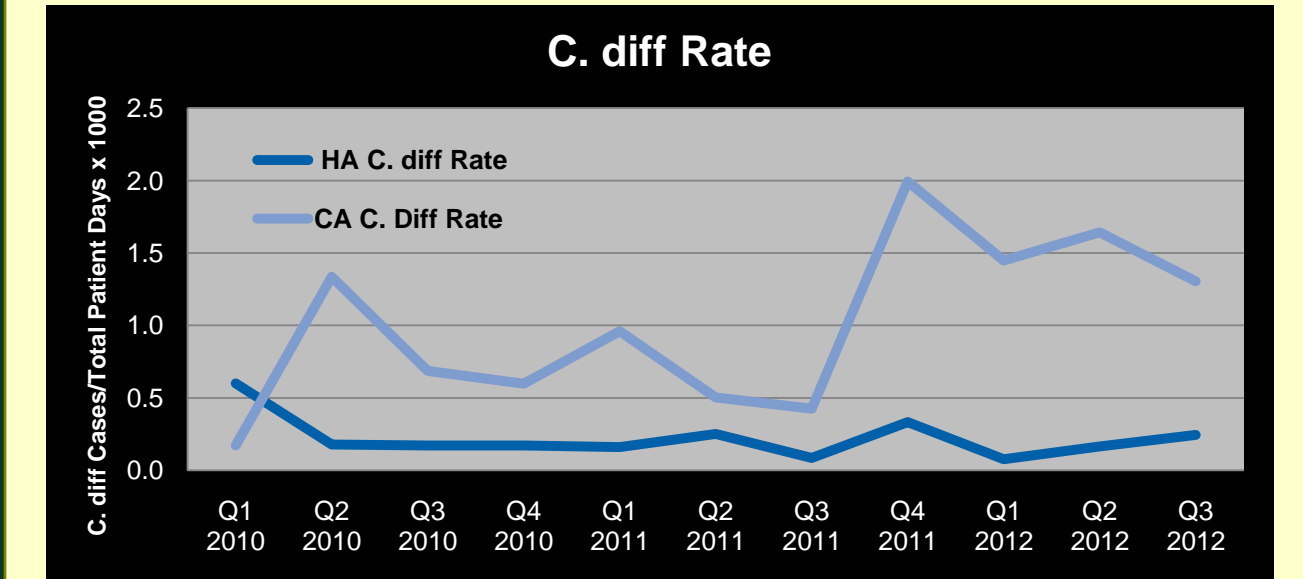
- ✓ Perform hand hygiene before entering room AND wash hands with soap and water before leaving room. Lávese las manos con agua y jabón.
- ✓ Wear gloves when entering room or cubicle, and whenever touching the patient's intact skin, surfaces, or articles in close proximity.
- ✓ Wear gown when entering room or cubicle and whenever anticipating that clothing will touch patient items or potentially contaminated environmental surfaces.
- ✓ Use patient-dedicated or single-use disposable shared equipment or clean and disinfect shared equipment (BP cuff, thermometers) between patients.

**PRECAUCIONES DE CONTACTO**  
Los visitantes deben presentarse primero al puesto de enfermería antes de entrar. Lávese las manos. Póngase guantes al entrar al cuarto.

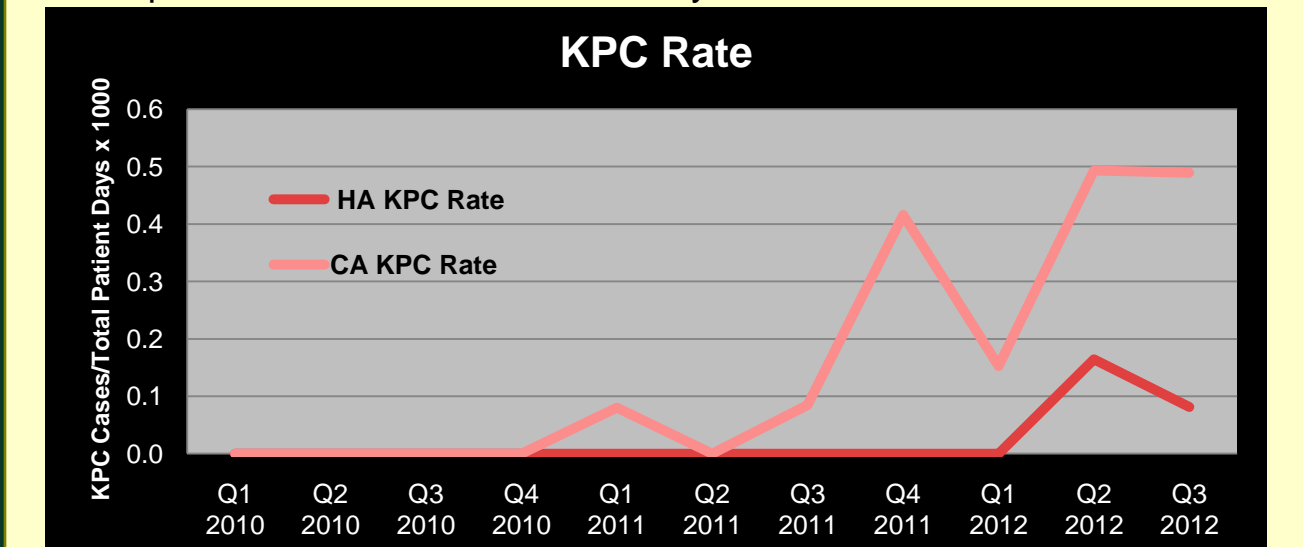
## RESULTS



- Increases in community-associated (CA) MRSA had no impact on healthcare-associated (HA) MRSA rates
- Incidence of HA MRSA dropped to zero in 3<sup>rd</sup> Quarter 2011 and has been maintained



- Rate of healthcare-associated C. diff was diminished during project implementation while the community-associated C. diff rate increased



- Zero HA KPC infections through March 2012
- Incidence of HA KPC in Q2 and Q3 2012 correlates with increased CA KPC during the same interval

## LESSONS LEARNED

### Keys to Success

- Interdisciplinary involvement in developing, educating and implementing practice changes
- Multi-level stakeholder buy-in and involvement from project initiation
- Frontline staff input to promote compliance with newly developed processes that directly impact their practice

## CONTACT INFORMATION

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