

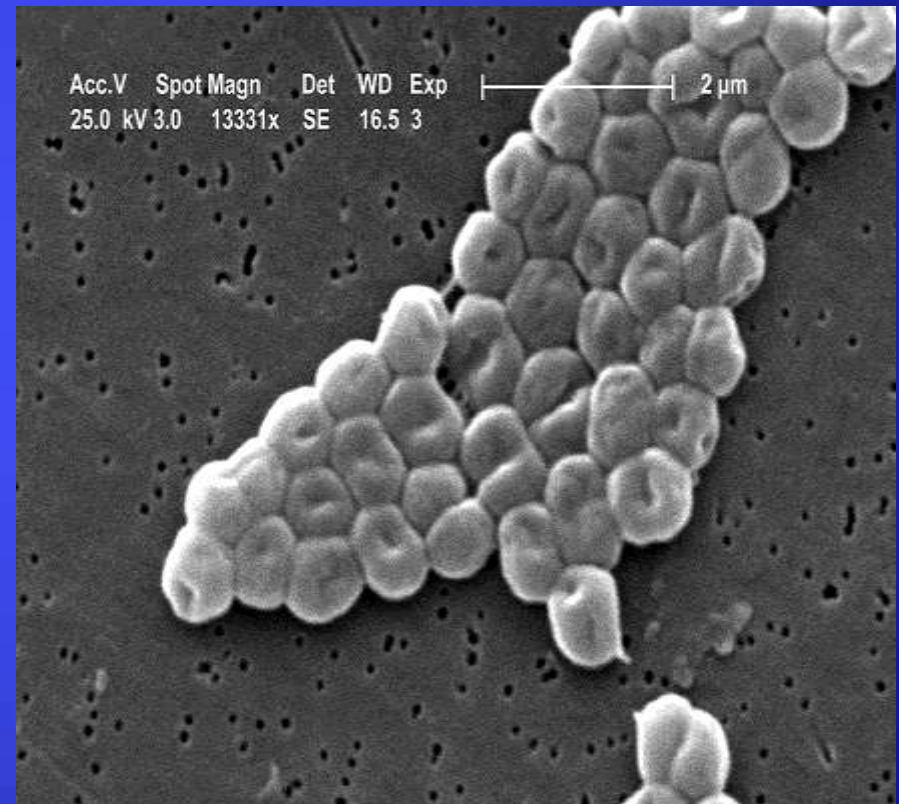
MDR *Acinetobacter baumannii* in the Short Term and Long Term Acute Care Setting

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MDR *Acinetobacter* Infection

Microbiology

- Aerobic, gram-negative bacillus
- Widely distributed in nature and hospital environment
- Frequent colonization
 - Long-term patients



Epidemiology

- Live for months on env surfaces
- Mortality 25-54% in ICUs
- Limited treatment options
- Ability to develop resistance to multiple antimicrobial agents

Epidemiology

MDRO	Duration of Survival
<i>Acinetobacter</i>	Days to 5 months
<i>Clostridium difficile</i>	Weeks to 5 months
<i>Enterococcus</i> (VRE)	Days to 4 months
<i>Staphylococcus aureus</i> (MRSA)	Weeks to months
Hepatitis B virus	7 days
Norovirus	12-14 days

Kramer A et al. BMC Infect Dis 2006; 6:130
Hota B Clin Infect Dis 2004; 39:1182

Risk Factors

- ICU admission
- Aminoglycoside therapy
- Maintenance ventilation
- Bacteremia; other microorganisms
- Recent invasive procedure
 - CVC
- Number of antimicrobials used

Health Care System Profile

Multi-entity hospital system

Tertiary care, Level 2 trauma

Community, not-for-profit system

Short term acute care hospitals

-120 licensed beds

-474 licensed beds

Long term acute care (est. 2009)

-50 licensed beds



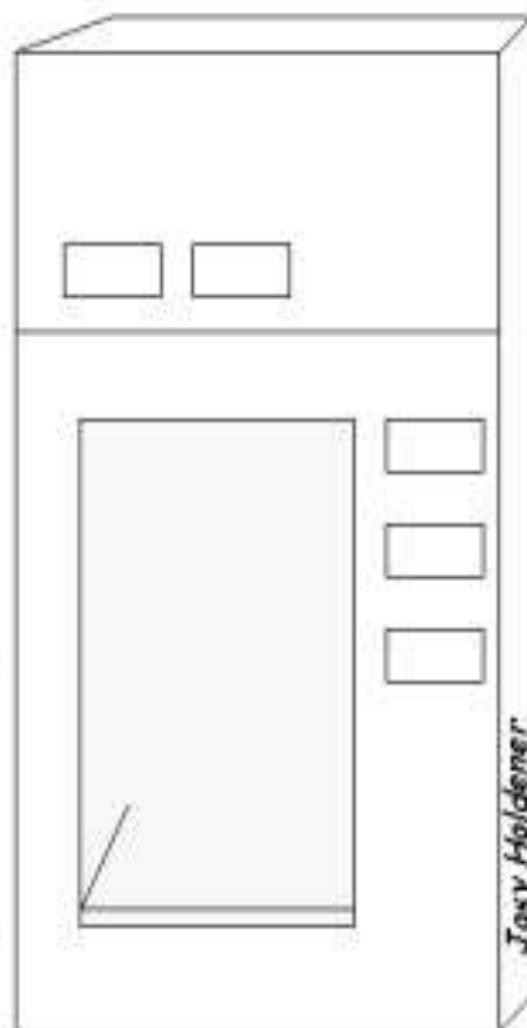
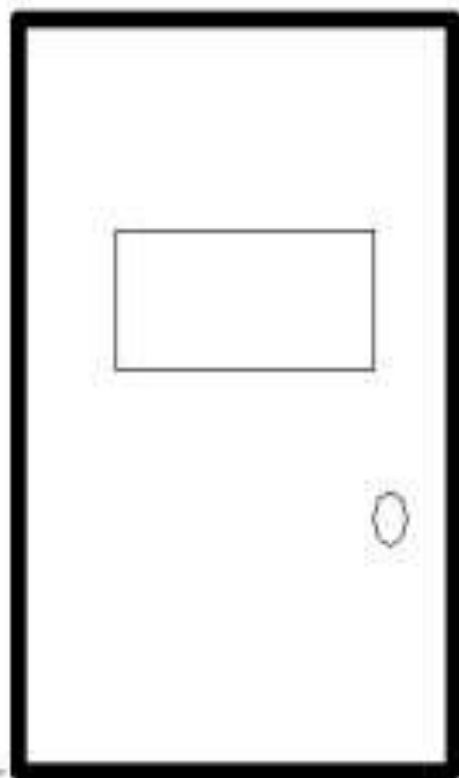
**UNIVERSITY COMMUNITY
HEALTH™**



The Beginning

- April 2009
 - MDR *Acinetobacter baumannii* isolate in leg wound
 - WCC to LTAC
- 12 month review
 - Laboratory reports at all 3 facilities
- Positive isolates identified at the LTAC and Medical Center campuses

Precaution



...in this area I better change into a spore!

Purpose

- Determine the etiology of increased incidence of healthcare-associated MDR-AB in pt population

Study Definition

- Case-only Study
- 12 month period

Methods

- Line list
 - Admission history
 - Transferred from facility
 - Infection type
 - Specimen type
 - Date of onset
 - On ventilator (vent number)

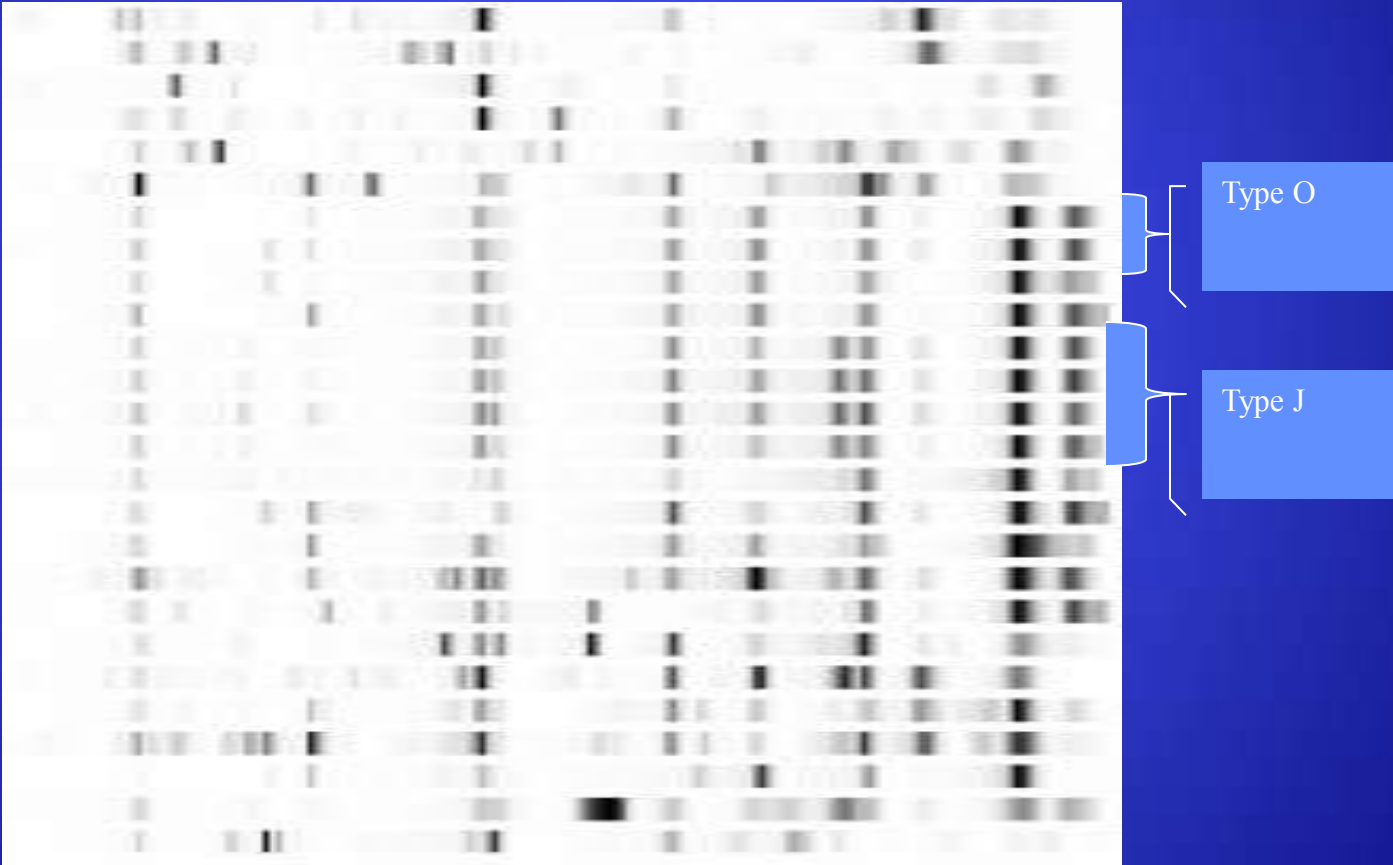
Methods

- Positive isolates were sent for DNA typing by pulse-field gel electrophoresis (PFGE)

Methods

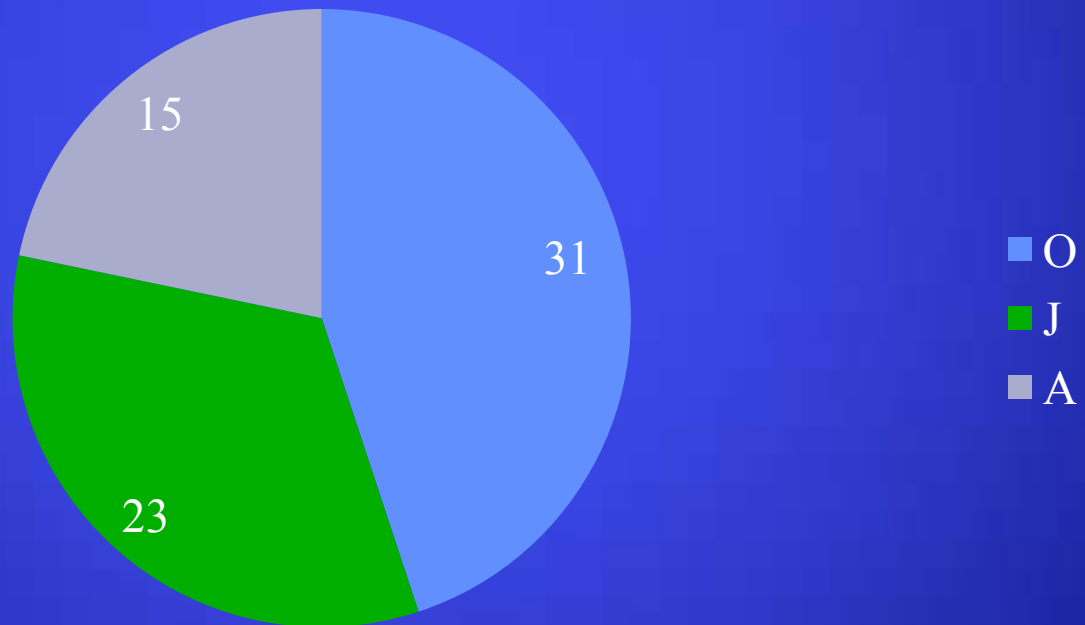
- PFGE results
 - Total of 62 isolates
 - Three predominant strain types
 - Type O 31%
 - Type J 23%
 - Type A 15%
 - 18 different strain types
 - 4 counties

Pulsed-field profile of *A. baumannii* strains isolated



Genotypes

Percentage



Community Acquired vs Healthcare Associated

- 73% were HA isolates
- 27% were CA isolates

Methods

Education of clinicians

- Does this organism develop resistance?
- Why is this organism clinically important?
- Where does the organism live?
- How they can help?
- Can the patient have visitors?

Multi Drug Resistant Organisms (MDRO) Health Care Worker

University Community Hospital * University Community Hospital-Carrollwood * Helen Ellis Memorial Hos
Helen Ellis Memorial Hospital * Pepin Heart Hospital & Dr. Kiran C. Patel Research Institute * Long Term Ac
Long Term Acute Care Hospital at Connerton * University Community Hospital * University Hospital-Carro
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Multi Drug Resistant Organisms(MDRO) Health Care Worker

SCIENCE

In the last several years, the frequency and spectrum of antimicrobial-resistant infections have increased in both the hospital and the community. Certain infections that are essentially untreatable have begun to occur as epidemics both in the developing world and in institutional settings in the United States. The increasing frequency of drug resistance has been attributed to combinations of microbial characteristics, selective pressures of antimicrobial use, and societal and technologic changes that enhance the transmission of drug-resistant organisms. Antimicrobial resistance is resulting in increased morbidity, mortality, and health-care costs. Prevention and control of these infections will require new antimicrobial agents, prudent use of existing agents, new vaccines, and enhanced public health efforts to reduce transmission.

Initially, the problem of bacterial resistance to antimicrobial drugs was solved by the discovery of new classes of drugs, such as the aminoglycosides, macrolides, and glycopeptides, as well as by the chemical modification of previously existing drugs. Unfortunately, there is no assurance that the development of new antimicrobial drugs can keep pace with the ability of bacterial pathogens to develop resistance. Colonization and infection with these bacteria have also been associated with lengthy hospital stays; increased use of and more potent antibiotics and surgical procedures.

Clinical Importance Of MDROs

[Note: Multidrug-resistant strains of *M. tuberculosis* are not addressed in this paper because of the markedly different patterns of transmission and spread of the pathogen and the very different control interventions that are needed. Recommendations for prevention and control of tuberculosis can be found at <http://www.cdc.gov/mmwr/pdf/rr/rr5417.pdf>.]

Multidrug-resistant organisms (MDROs) are defined as microorganisms, **predominantly** bacteria, that are resistant to one or more classes of antimicrobial agents. Although the names of certain MDROs describe resistance to only one agent (eg, MRSA or VRE), these pathogens are frequently resistant to most available antimicrobial agents.

These highly resistant organisms deserve special attention in healthcare facilities. In addition to MRSA and VRE, certain Gram-negative bacilli (GNB)—including those producing extended spectrum beta-lactamases (ESBLs) and others that are resistant to multiple classes of antimicrobial agents—are of particular concern. These include:

Education of Patient and Family

- Guide developed to educate
 - Patients
 - Family members
 - Visitors

Other Interventions

- Daily IC rounds on Nursing units
- Special Contact isolation
 - Respiratory; add Droplet
- Hypochlorite disinfection
- Soap and water hygiene or alcohol foam
- Automated reports of MDRO history
- Educational tool for patients and families

Other Interventions (cont'd.)

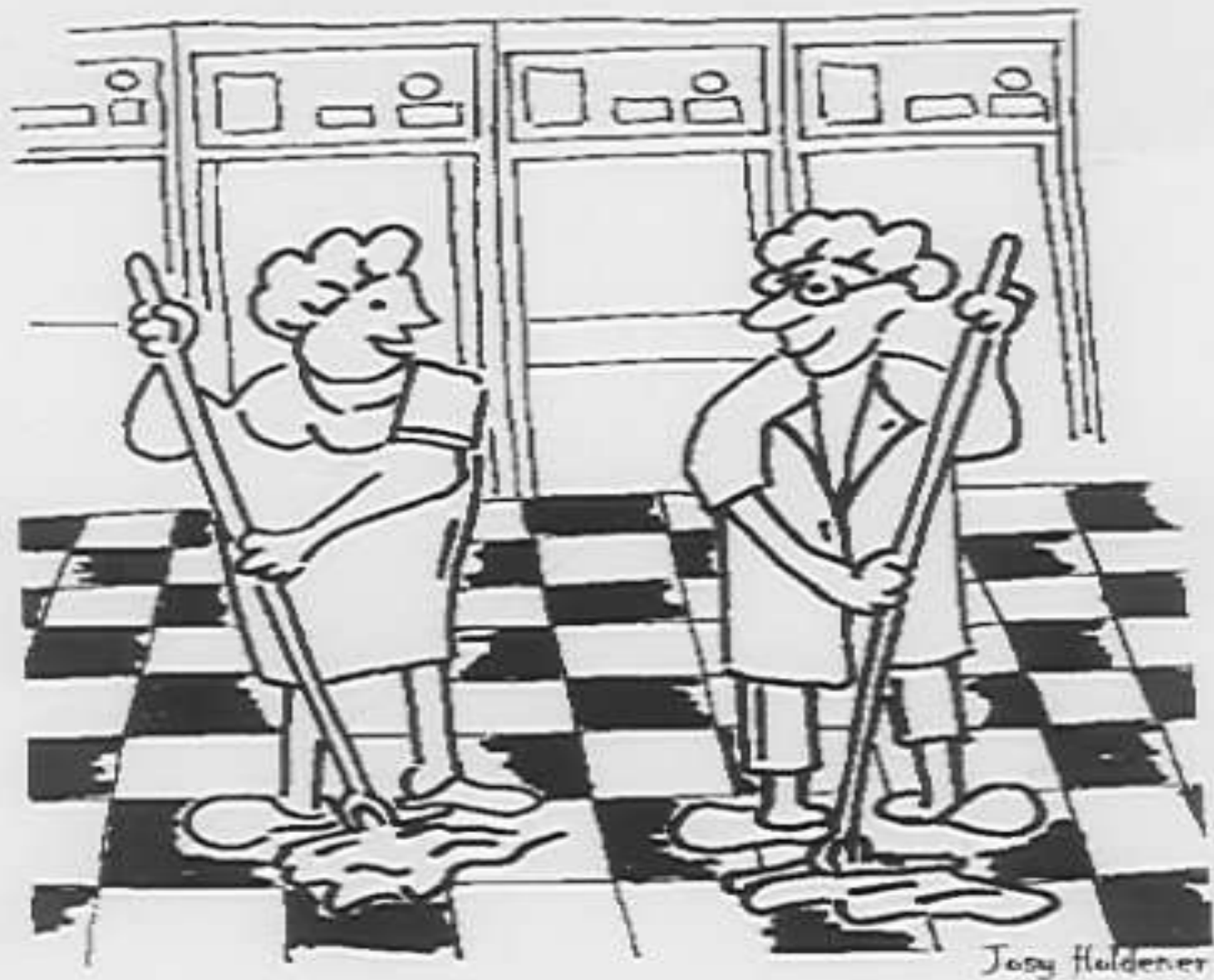
- Automated Nursing unit rounds reports with isolation category
- Standardized Nursing unit process to organize isolation reports
- Dedicated equipment to each room
- Use of hypochlorite wipes for all reusable equipment

Other Interventions (cont'd.)

- Env cultures of high touch surfaces
- Intensive monitoring of HCW practices upon entering and exiting room
- Admission screening for:
 - Short term acute – ICU, Step down units
 - Long term acute – All admissions

Other Interventions (cont'd.)

- Intensive monitoring to ensure admission cultures/tests obtained



"Beth, I have to leave earlier today, let's clean just the white squares!"

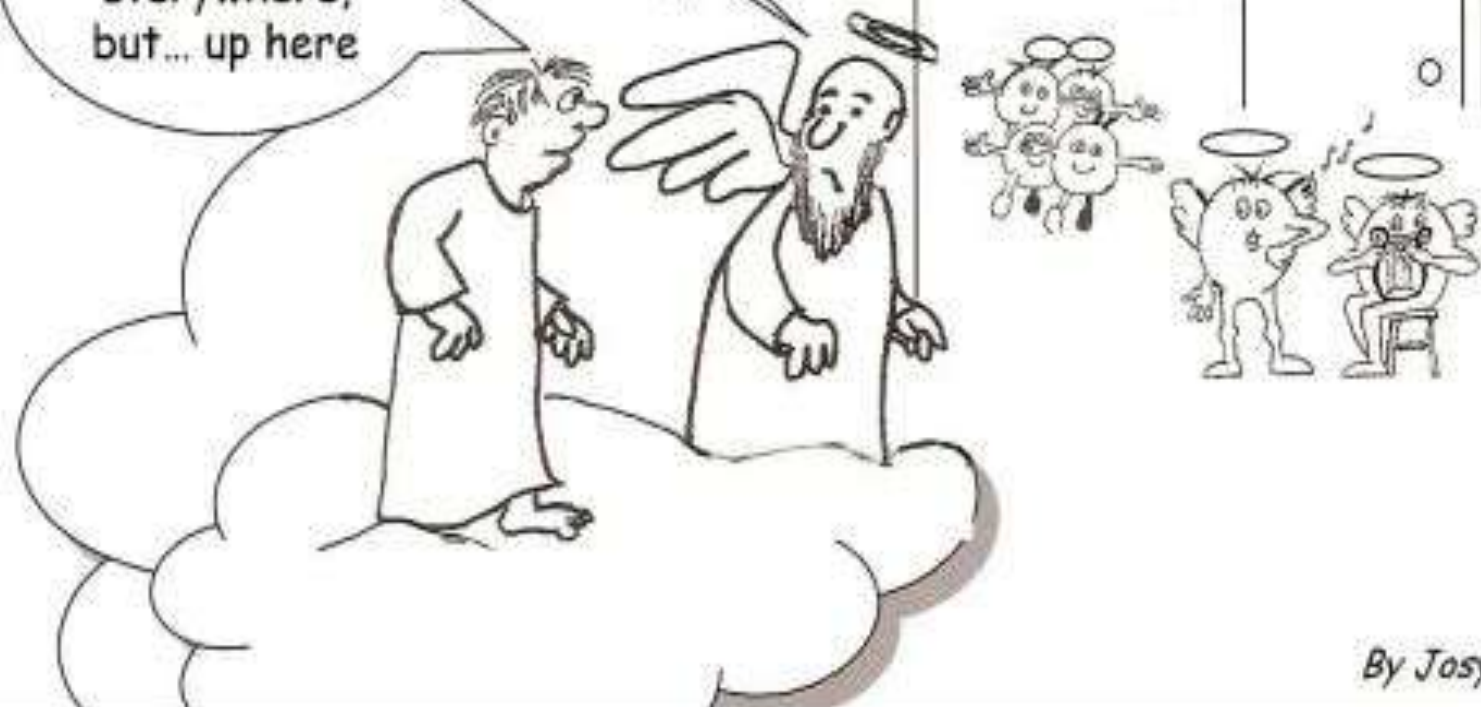
Other Interventions (cont'd.)

- Interviews with Env Service personnel
- Interviews with Wound Care Nurse
- Interviews with Respiratory Therapists
- Labels for doors once cleaned and disinfected

What do you mean
you're surprised?

Well, I knew
bacteria are
everywhere,
but... up here

WELCOME to HEAVEN



By Josy

Door Seal

**Sealed for Excellence in Anticipation
of Pleasing our next Guest**

Reports

- Automated isolation reports
- Daily reports sent to
 - Environmental Services
 - Color coded
 - Nursing supervisor
 - Patient placement
 - Nurse Directors/Leaders
- Weekly Directors report

Hypochlorite Disinfection Protocol

- Scope
 - One patient
 - Entire unit disinfection*
- Duration
 - Entire unit disinfection for one week after last patient discharged

Special Contact Isolation sign

- Updated to include *Acinetobacter*
 - Window to demonstrate
 - Hypochlorite (Bleach) clean
- Language
 - English
 - Spanish

SPECIAL CONTACT PRECAUTIONS

All Family, Visitors, Physicians and Hospital Staff **MUST** Adhere to the Following Precautions:



WEAR GLOVES to enter
room



WEAR GOWN to
enter room



WASH HANDS

**ATTENTION TO ALL FAMILY,
VISITORS AND STAFF:**

SOAP AND WATER HANDWASHING ONLY

Bleach clean

- Before entering room
- After removing gloves
- After patient care
- After touching body fluids
- Before caring for another patient

STANDARD PRECAUTIONS AT ALL TIMES!

Clean all reusable objects entering the patient's room with a hospital-approved disinfectant before leaving the room.

Additional Data Analysis

Mean Age and LOS

	Med Center	Carrollwood	LTAC	Overall	
Mean age	64			65	P = 0.05
Mean LOS	25.63			32.70	P = 0.05

Gender by LOS

	<= 10 days	11 to 19 days	20 to 29 days	30 to 45 days	46 to 59 days	>=60 days	Total
Female	14.29	16.81	7.56	6.72	5.04	7.56	58%
Male	6.72	5.04	9.24	12.61	5.88	2.52	42%
Total	21.01	21.85	16.80	19.33	10.92	10.08	100%

Gender by Age Category

	20 to 29	30 to 45	46 to 59	60 to 74	>= 75	Total
Female	0	6.72	14.29	20.17	16.81	58%
Male	0.84	5.04	5.88	17.65	12.61	42%
Total	0.84	11.76	20.17	37.82	29.41	100%

Age Category by LOS

	<= 10 days	11 to 19 days	20 to 29 days	30 to 45 days	46 to 59 days	>=60 days	Total
20 to 29	0	0	0	0	0	0.84	0.84
30 to 45	2.52	0.84	1.68	3.36	0.84	2.52	11.76
46 to 59	2.52	5.04	5.04	2.52	2.52	2.52	20.17
60 to 74	7.56	8.40	8.40	7.56	4.20	1.68	37.82
>=75	8.40	7.56	1.68	5.88	3.36	2.52	29.41
Total	21.01	21.85	16.81	19.33	10.92	10.08	100.00

MRSA by VRE History

MRSA	VRE			
		No	Yes	
No	28.57	30.25	58.82	
Yes	30.61	69.39	41.18	
	41.18%	58.82%		

Gender by MRSA hx

	MRSA		Total
	No	Yes	
Female	33.61	24.37	57.98
Male	25.21	16.81	42.02
Total	58.82	41.18	100%

P = 0.1461 approaching significance

New technology

New technology

- UV-C
 - Senses the size of the room
 - Adjusts output
 - Any surface exposed will be affected
 - Takes approximately 8-10 minutes for average patient room



IRS 3200m



Environmental Cultures

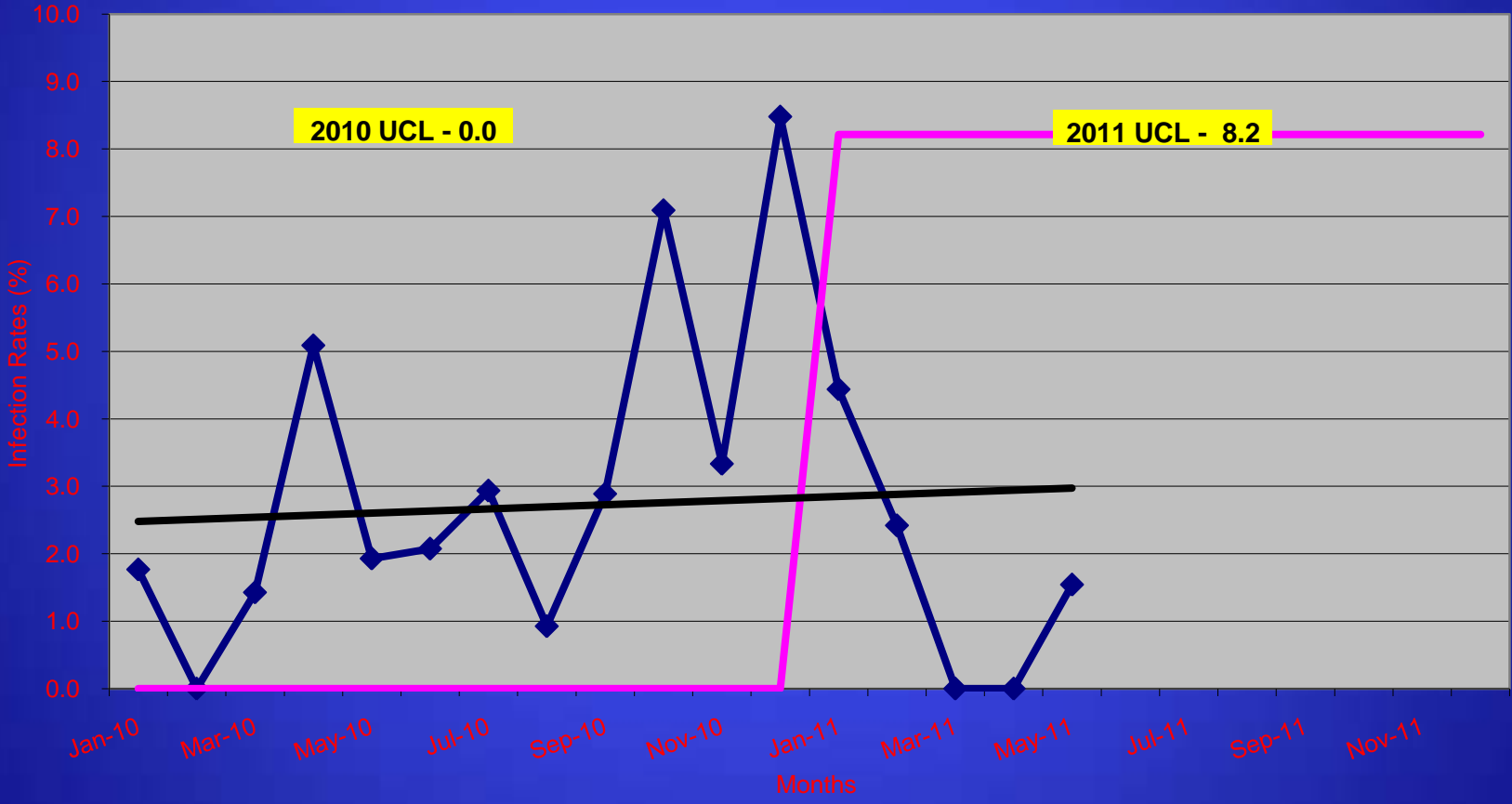
- 30 patient rooms
- Rodac plates
 - Door handle
 - Sink handles
 - Commode seat
 - Side rail of bed
 - Overbed table
 - Call button/TV remote
 - Suction canister



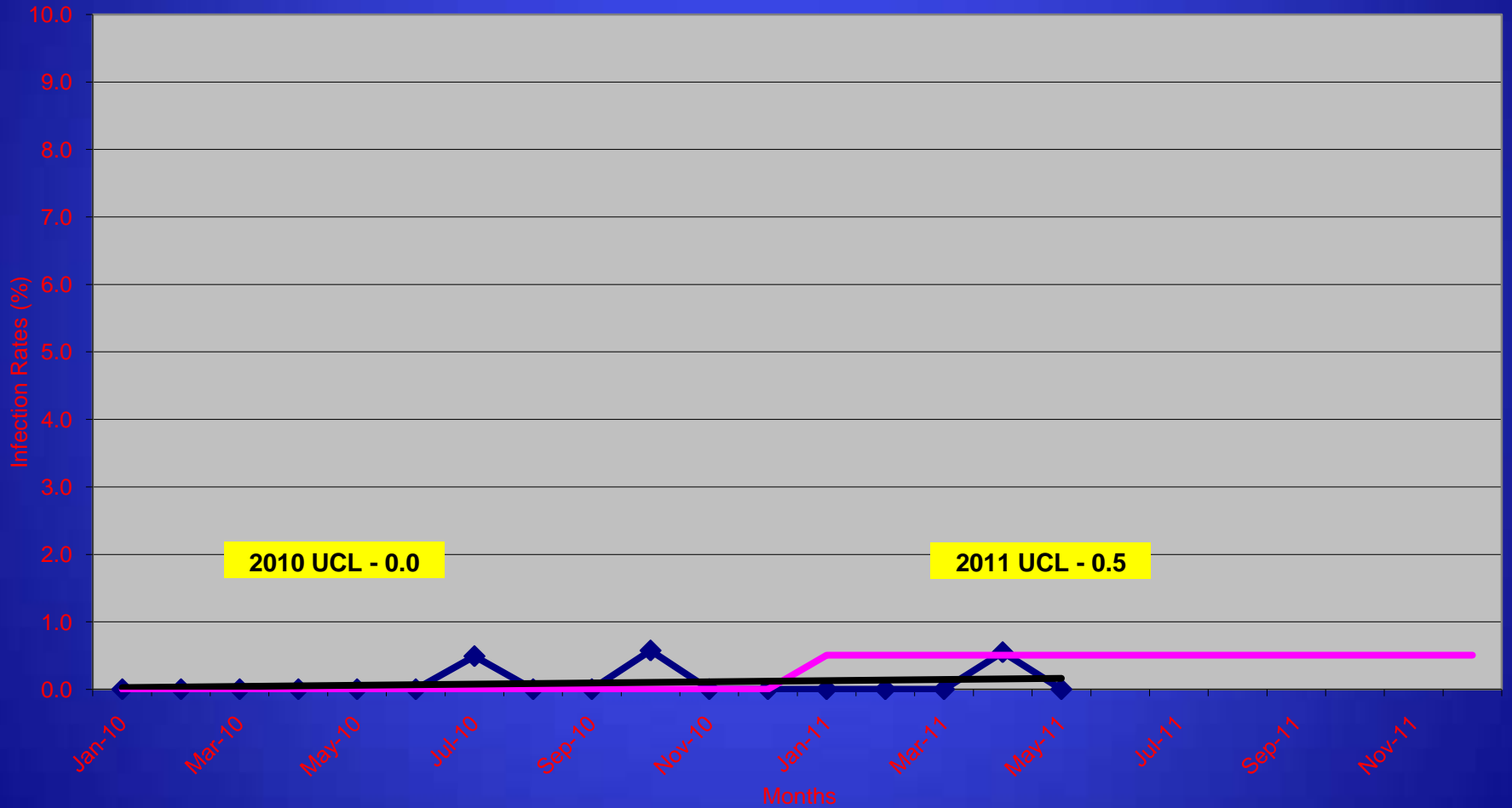
Results

98% reduction in
microorganisms

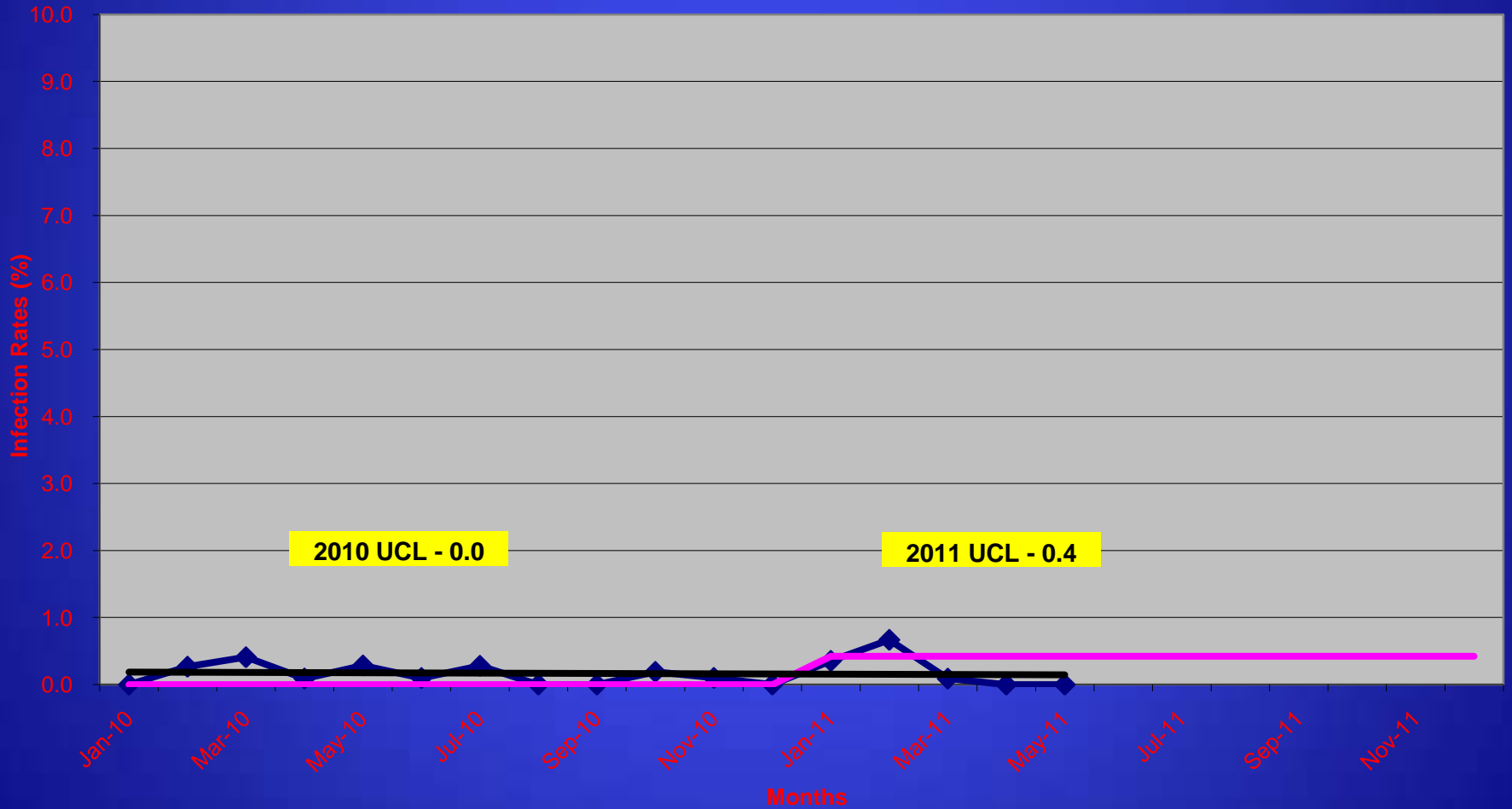
LTAC Hospital
MDRO ACI BAU Health Care Associated Rate



Carrollwood Hospital MDRO ACI BAU Health Care Associated Rate



University Community Hospital MDRO ACI BAU Health Care Associated Rate



Summary for control and prevention of MDR Ab

- Point source control
- Standard precautions
- Contact barrier precautions
- Env cleaning and disinfection
- Cohorting of patients
- Cohorting of personnel
- Antimicrobial stewardship
- Surveillance



Questions

