# **APIC 43rd Annual Conference** June 11-13 • Charlotte, NC

Modifying the CDCs Guidelines for Isolation Precautions for Multi-Drug Resistant Organisms (MDROs): Using Contact Precautions Only for Clearly Defined Portals of Exit

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# **Objectives**

- 1. Describe the rationale for substantially altering the use of Contact Precautions for MDROs
- 2. State three advantages for hospital operations by using a substantially modified Isolation Precautions approach for MDROs
- 3. State three challenges with modifying the CDC's Isolation Guidelines for MDROs

# Modifying the CDCs Guidelines...

• Challenging, but possible

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- We all modify them at least a bit, right?
- Maybe we could call it "re-interpreting..."













# **Isolation Precautions Background**

- Healthcare-based Isolation Practices have a surprisingly lengthy history
- Mid-1800s: Hospital Infection Prevention starts
  - Semmelweis (Austria) 1847
  - Pasteur (France) 1857

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- 1853-54: Our first significant "IP" hospital model came from Florence Nightingale
- Mid-1870s: US began Infectious Disease Hospitals, closed in 1950s (TB ones in 1960s)
- 1910: began the Cubicle System = Barrier Nursing Practices, the earliest modern isolation system







# The CDC Finally Gets Involved

- 1970: the CDC's first guidelines, 7 categories of precautions
- 1975 & 1983: CDC updated guidelines, "Blood and Body Fluid," deleted Protective Precautions
- 1985: Universal Precautions replaced Blood & Body Fluid Precautions
- 1987: Body Substance Isolation

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• 1991: OSHA Bloodborne Pathogens Standard

## **Modern Era – Isolation Precautions**

- 1996: CDC/HICPAC group updated isolation guidelines
  - Established Standard Precautions
  - Established Airborne, Droplet, & Contact Precautions, used alone or in appropriate combination
- 2006: CDC issued lengthy multi-drug resistant organism (MDRO) guidelines
  - reviewed epidemiology
  - graded recommendations for control and prevention

## **Present-Day CDC Guidelines**

- 2007: CDC's current Isolation Guidelines
  - Standard + Airborne Droplet Contact Precautions continued
  - Added guidance for non-hospital settings
  - Broadened guidance for emerging and evolving pathogens
  - Respiratory Hygiene/Cough Etiquette
  - Safe injection practices
  - Use of masks for insertion of catheters or injection of material into spinal or epidural spaces
  - Increased emphasis on environmental controls for at-risk patient populations
  - Added focus on MDROs and Healthcare Associated Infections (HAIs)

## **Newest CDC Guidelines**

- 2009: <u>Guidance for Control of Infections with [CRE]...</u> in Acute Care Facilities (MMWR 3/20/2009)
- "Controlling" CRE may be challenging; It's in our communities, and thus our hospitals
  - "in some areas of the United States, notably New York City, CRE are routinely recovered, including from many patients who are admitted from the community. In these settings, point prevalence surveys in response to detected clinical cases might be less useful in controlling transmission of CRE. Facilities in regions where CRE are endemic should monitor clinical cases of CRE and implement the intensified (i.e., Tier 2) infection control strategies outlined in the 2006 HICPAC guidelines if rates of CRE are not decreasing (2)."

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## **Newest CDC Guidelines**

- 2015: Updated the 2009/2012 CRE Control Guidelines:
- Simplified recommendations from two tiers into one
- Continued call for Hand Hygiene and Contact Precautions for all patients colonized and infected with CRE
- Expanded information about types of CRE and laboratory guidance / testing methodology
- Detailed multiple surveillance culture strategies
- Tried to differentiate how to manage CRE in acute vs. long term care settings
- Referred back to 2006 MDRO guidelines

## **Limitations of CDC Guidelines?**

- Initiation/discontinuation information for Contact Precautions emphasized need for "more studies," with no clarity on when to discontinue precautions
- "Patients with MDROs/MDRO carriers [may be] colonized permanently and manage them accordingly."
- Long Term Care may need Contact Precautions "when there is continued transmission"
- Ambulatory/Home care the "risk of [MDRO] transmission...has not been defined. Consistent use of Standard Precautions may suffice in these settings, but more information is needed."

## **Brief Commentary on Guidelines**

- HICPAC is methodological, detailed, thorough, wellresearched, consensus-seeking, and often *slow*.
- Strategies for MDRO control are complex, time intensive, expensive, with little evidence for success
- Guidelines pre-date era of public reporting
- Rigid, one-size fits all, for acute care
- Lack evidence for managing multiple sites of care differently (e.g., outpatient vs. inpatient)
- Assume colonization creates same risk as infection with active portal of exit
- Insufficiently address community burden of MDROs

# State of the State/Reality



- Our world: NYU Langone Medical Center, NYC
  - Main Hospital is Tisch & HCC Pavilions (705 beds)
  - Hospital for Joint Diseases ~ 190 beds
  - Lutheran Medical Center (450 beds) new as of 1/1/16
- Tisch-HCC-HJD 15,000 employees, ~65 Operating Rms, ~ 95 ICU beds, ~39,000 Admissions, ~4,600 Births, >650,000 Outpatient Visits
- IPC Department = 7 RNs, ~1:150 ratio, 5 Data Staff, 1 Administrative Assistant, 1 MD Hospital Epidemiologist, & 4 p/t MD Associate Epidemiologists (~1.2 FTE total)



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## State of the State: NYU Pre-07/2015

- Inpatient Rooms mostly 2 patient rooms, a few singles, a few quads or triples – most are "step down units"
- EMR gave reliable alerts for past MDRO infections (2007)
- Patients were readmitted to Contact Precautions (CP) if past MDRO infection was within about 1 year (managed on a case-by-case)
- Nov. 1, 2012 to mid-Jan 2013: Hospital CLOSED due to Superstorm Sandy
- Since reopening, census as high / higher than pre-Sandy
- Past ~ 12 months daily alerts about hallway patients, PACU borders, regardless of season, precautions-stress

## State of the State: NYU Pre-07/2015

- NYU IPC department follows 2007 CDC guidelines for isolation precautions pretty much "by the book" ... but ...
- PPE needed when in the "patient zone" (remember 2 patient room structure)
- Pediatric patients with viral respiratory pathogens Contact and Droplet Precautions for duration of illness
  - Biofire PCR respiratory viral panel testing (2013)

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- Patients with diarrhea CP until symptom-free for 48 hours (2008)
  - *C. difficile* mandatory private room/blocked bed, or cohort and CP until symptom-free for 48 hours; now use PCR testing (2012)

## State of the State: NYU Pre-07/2015

- MDROs (2008): Use CP
  - Blood if patient had any form of a central line
  - Respiratory, Wound, or Urine (unless pt voiding independently)
  - Body site with any portal of exit (e.g., bile with a drain)
- CP stopped when acute infection "resolved"
- Cohorted like organisms only, meant lots of blocked beds
- MRSA no CP for nasal colonized pts
- VRE no CP (2008)
- Stool with MDROs No CP

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## **Control of Pathogens: Current State**





## Management of Multidrug-Resistant Organisms In Healthcare Settings, 2006

Jane D. Siegel, MD; Emily Rhinehart, RN MPH CIC; Marguerite Jackson, PhD; Linda Chiarello, RN MS; the Healthcare Infection Control Practices Advisory Committee

Acknowledgement:

The authors and HICPAC gratefully acknowlege Dr. Larry Strausbaugh for his many contributions and valued guidance in the preparation of this guideline.

- Rules based
- Prevention efforts not focused

## **Control of Pathogens: Current State**



## 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings

Jane D. Siegel, MD; Emily Rhinehart, RN MPH CIC; Marguerite Jackson, PhD; Linda Chiarello, RN MS; the Healthcare Infection Control Practices Advisory Committee

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# *Klebsiella pneumoniae* Carbapenemase (KPC) Guidelines



### **Guidance for Control of Infections with Carbapenem-Resistant or Carbapenemase-Producing** *Enterobacteriaceae* in Acute Care Facilities

Infection with carbapenem-resistant *Enterobacteriaceae* (CRE) or carbapenemase-producing *Enterobacteriaceae* is emerging as an important challenge in health-care settings (1). Currently, carbapenem-resistant *Klebsiella pneumoniae* (CRKP) is the species of CRE most commonly encountered in the United States. CRKP is resistant to almost all available antimicrobial agents, and infections with CRKP have been associated with high rates of morbidity and mortality, particularly among persons with prolonged hospitalization and those who are critically ill and exposed to invasive devices (e.g., ventilators or central venous catheters). This report provides updated recommendations from CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC) for the control of CRE or carbapenemase-producing *Enterobacteriaceae* in acute care (inpatient) facilities. For all acute care facilities, CDC and HICPAC recommend an aggressive infection control strategy, including managing all patients with CRE using contact precautions and implementing Clinical and Laboratory Standards Institute (CLSI) guidelines for detection of carbapenemase production. In areas where CRE are not endemic, acute care facilities should 1) review microbiology records for the preceding 6--12 months to determine whether CRE have been recovered at the facility, 2) if the review finds previously unrecognized CRE, perform a point prevalence culture survey in high-risk units to look for other cases of CRE, and 3) perform active surveillance cultures of patients with epidemiologic links to persons from whom CRE have been recovered. In areas where CRE are endemic, an increased likelihood exists for importation of CRE, and facilities should consider additional strategies to reduce rates of CRE (2). Acute care facilities should review these recommendations and implement appropriate strategies to limit the spread of these pathogens.

For CRKP, the most important mechanism of resistance is the production of a carbapenemase enzyme,  $bla_{kpc}$ . The gene that encodes the  $bla_{kpc}$  enzyme is carried on a mobile piece of genetic material (transposon), which increases the risk for dissemination. Since first described in North Carolina in 1999, CRKP has been identified in 24 states and is recovered routinely in certain hospitals in New York and New Jersey (3). Analysis of 2007 data regarding health-care--associated infections reported to CDC indicated that 8% of all *Klebsiella* isolates were CRKP, compared with fewer than 1% in 2000 (CDC, unpublished data, 2008). CRKP poses significant

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## **Control of Pathogens: Current State Facility Guidance for Control of Carbapenem-Resistant Enterobacteriaceae (CRE) November 2015 Update**

This document updates CDC's Guidance for Control of Carbapenem-resistant Enterobacteriaceae (CRE): 2012 CRE Toolkit. Unless otherwise specified, the term healthcare facility refers to all acute care hospitals and any long-term care facility the has patients who remain overnight and regularly require medical or nursing care (e.; maintenance of indwelling devices, intravenous injections, wound care, etc.). This includes all long-term acute care hospitals and nursing homes providing skilled nurs

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## **Benefits of Contact Precautions**

- Minimize pathogen transmission
- Reduce hospital acquired infections
- Lower morbidity
- When used as a multipronged approach to outbreaks, can increase improvement
- More cost effective to pay for control measures than potential spread of infections

## Harms from Contact Precautions

- Less patient-health care worker contact
- Changes/delays in systems of care
- Increased symptoms of depression/anxiety
- Decreased patient satisfaction
- Impact on patient safety (falls, pressure sores)
- Increased costs and waste
- Uncomfortable for family members
- CP was a problem even a decade ago!

# Rationale for Changing CP

- Growing evidence between contact precautions and increased complications
- Mitigating risks for patients who truly need isolation vs patients who can go without
- Optimizing patient safety while promoting patient centered care
- CP compliance is challenging
- Improved patient throughput
- Decrease cost of isolation care

# **Changed CP**

- CP policies modified to be used only when:
  - Draining wounds
  - Ventilator, tracheostomy with significant secretions
- No CP for
  - Wounds CDI
  - Urinary catheters, central lines, drains, etc.
  - Respiratory infection w/o significant sputum production





## **Change Management**

- Revised hospital policies and protocols
- Developed new guidelines
- Strategic roll-out

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- Massive education/inservices
- Unit based and executive meetings
- Distribution of large, laminated guides
- Updates to intranet site
- Education is a never-ending activity



# NYULMC CP Policy 07/2015

### 2. Patient Placement

- a. Patients should be placed in a private room or in a room with an adjacent blocked bed. When a private room is not available, place the patient in a room with another patient who is infected/colonized with the same microorganism (cohorting).
- b. When a private room is not available and cohorting is not achievable, consider the epidemiology of the microorganism and the patient population when determining appropriate patient placement. The following criteria must be satisfied if a private room is not available and cohorting is not achievable:
  - 3 feet of separation between the beds of the patient requiring Contact Precautions and other patients.
  - Separate toileting arrangement for patient requiring Contact Precautions and other patients.
  - The patient in bed next to the patient on Contact Precautions is expected to have a short length of stay and is at low risk for infectious complications.

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		a central venous catheter	
		<ul> <li>a ventilator or tracheostomy</li> </ul>	
		an open surgical incision or non-intact skin	
Bed bags	Standard	Block bed or private room	After bed bug protocol is completed
Cystic fibrosis	Contact	Any patient without:	Duration of hospitalization
		<ul> <li>immunozupprezzion*</li> </ul>	
		cystic fibrosis	
		Provide separate toileting facilities	
	-	Patient wears mask when outside room	
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· senerotongenic E. con	Otherwise - standar	Don't order these assays when the	patient's symptoms are
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Suspect/confirmed infection	holation type	Who may be cohorted	When to discontinue isolation	
Mycoplasma preumoniae	Droplet	Any patient without:	24 hours after fever resolves and improvement	
Neutropenia	Neutropenia	Black had or private room	Per Numine neutrosenia palicy	
Nevel or pathogenic influenza	Airbanne & Contact	Airborne isolation room	Duration of hospitalization	
(H5N1, H7N9)				
Pertussis (B. pertussis)	Droplet	Block bed or private room	After 5 days of effective therapy	
and the second second	Order respiratory PCR i	if the patient has fever & cough/	espiratory symptoms consistent with	
Respiratory PCR - viruses	pneumonia. Do not order when a primary non-infectious etiology is likely, such as appiration			
Adenovirus	Adult: Droplet	Any patient without:	<ul> <li>24 hours after fever resolves and</li> </ul>	
Coronavirus		Immunesuppression*	improvement in cough/respiratory	
Human metapneumovirus	Peda: Droplet & Contact	Who is not:	symptoms	
Parainfluenza     Respiratory supervisit visua		<ul> <li>pregnant</li> <li>pregnant</li> </ul>	hands	
(RSV)		lung condition	hospitalization or negative repeat	
1		<ul> <li>age &lt;12 months or &gt;75 year</li> </ul>	1 800 NY	
<ul> <li>Rhinevirus/enterovirus</li> </ul>	Adult: Droplet on	Any patient without:	<ul> <li>24 hours after fever resolves and</li> </ul>	
	TH 162, otherwise	<ul> <li>immuneouppression*</li> </ul>	improvement in cough/respiratory	
		e andenant	symptoms	
	Peds: Droplet & Contact	· receiving medication for a c	hrenic Immunosuppressed*: duration of	
		lung condition	hospitalization or negative repeat	
		• age <12 months or >75 year	1 B1189	
<ul> <li>Influenza A</li> </ul>	Adult Droplet	Any patient without	<ul> <li>Z4 hours after fever resolves and</li> </ul>	
Note: Neural or	Peds: Droplet & Contact	Whe is net:	symptoms of	
Note: Novel or		· pregnant	<ul> <li>4 days of oseitamivir</li> </ul>	
such as HSN1 or H7N9		<ul> <li>receiving medication for a c</li> </ul>	hrenic	
requires airborne and		lung condition	<ul> <li>Immunosuppressed*: duration of</li> </ul>	
contact precautions		· Mile 40		
	1	<ul> <li>HIV with CD4-200</li> </ul>		
SARS (Severe Acute Resp Syn)	Arberne & Contact	Airborne isolation room	Duration of hospitalization	
Scables	Contact	Any patient	24 hours after initiation of therapy	
Streptococcus, gp A,	Adult: Standard	Adult: any patient	Peds: 24 hours after initiation of	
Streategerous en A	Droplet	Any nations without	24 hours after initiation of therapy	
pneumonia or invasive		Immunesuppression*		
Streptococcus, gp A, wound	Contact & Dropiet	Any patient without:	24 hours after initiation of therapy	
		<ul> <li>immunecuppression*</li> </ul>		
Tuberculosis, draining cutaneo	ous lesion Contact	Any patient AM	smear negative or drainage resolved/contained	
Tuberculosis, meningitis	Standard	Any patient		
tubercurosis, putmonary/laryr	geal Airbarne	Airborne isolation room	APB IMAST negative & cough recorded	
Varicella, disseminated	Arborne & Contact	Airborne isolation room     Staff according to the charded by	All lesions dry & crusted	
Varicella, localized zoster in	Airborne & Contect	Airberne iselation room	Airborne isolation: when	
an immunocompromized*		· Staff providing care should I	disseminated soster ruled out	
patient (until disseminated		immune	<ul> <li>Contact isolation: when all lesions</li> </ul>	
reater is rune dot) Maximila (exclined excted in	Contrast il Insiene ann's	Any patient without	ery a crusted	
nen-immunecompremised	be covered	Any patient without:	All lesions any 6. crustee	
patient (1-2 dermatomes)		Whe is not:		
	Standard <sup>®</sup> if lesions can	<ul> <li>pregnant</li> </ul>		
	be covered with a	<ul> <li>varicella non-immune</li> </ul>		
	eressing	Staff providing care should be	Inmone	
varicella, primary (chickenagy)	Arborne o Contect	<ul> <li>Arborne polation room</li> <li>Staff annukling care should it</li> </ul>	All lesions dry 6. crusted	
Viral hemorrhagic fever	Airberne &	Airborne isolation room	Duration of hospitalization	
(Crimean-Congo, Ebola, Lassa,	Marburg) Contact			
Wound (draining) or abscess	Contact Ar	ny patient without:	Drainage stops or contained by	
		immunesuppression*	dressing, JP drain or wound VAC	
		a ventilator or tracheostomy		
		an open surgical incision or non-	intact skin	



#### **Guide to Inpatient Isolation Precautions**

Suspect/confirmed infection	Isolation type	Who may be cohorted	When to discontinue isolation
Abscess or draining wound	Contact	Any patient without:	Drainage stops or contained by
_		<ul> <li>immunosuppression*</li> </ul>	dressing, JP drain or wound VAC
		<ul> <li>a central venous catheter</li> </ul>	
		<ul> <li>a ventilator or tracheostomy</li> </ul>	
		<ul> <li>an open surgical incision or non-int</li> </ul>	act skin
Bed bugs	Standard	Block bed or private room	After bed bug protocol is completed
Cystic fibrosis	Contact	Any patient without:	Duration of hospitalization
		<ul> <li>immunosuppression*</li> </ul>	
		<ul> <li>cystic fibrosis</li> </ul>	
		Provide separate toileting facilities	
		Patient wears mask when outside ro	m
C. difficile PCR	Contact	Any patient with same NAP-1 status	No liquid stool for 48 hours
Diarrhea, presumed infection	Contact	Any patient	Isolate based on test results
& test results pending			
	Note: Gastrointes	tinal PCR panel includes C. diff and	is restricted to hospitalized patients ≤5 day
Gastrointestinal PCR	from admit. Orde	r C. diff PCR if patient admitted for	>5 days
Adenovirus	Contact if:	Any patient without:	No liquid stool for 48 hours
Accomonas so	<ul> <li>diapered</li> </ul>	<ul> <li>immunosuppression*</li> </ul>	
Astrovirus	<ul> <li>leaking ostomy</li> </ul>		
Cryptosporidium	<ul> <li>incontinent</li> </ul>	Provide separate toileting faci	lities
• Cyclospora	<ul> <li>unable to perfor</li> </ul>	m	
Enteroperative E coli	hand hygiene af		the untient has neutropaged of liquid
Enteropathic E. coli	toileting	Order Gror C. aliji PCR II	the patient has acute onset of liquid
Enteropatine E. coli		stool for >12 hours and i	nfectious gastroenteritis is likely.
Pleisomonas shia	Otherwise – standa	rd Don't order these assays	when the patient's symptoms are
• Rotavirus	precautions	explained by non-infection	ous causes, such as colostomy output,
Sapovirus		initiation of enteral feed	s or pro-motility agents
Vibrio parahemolyticus			
Yersinia enterocolitica			
Campylobacter sp.	Contact if:	Block bed or private ro	om No liquid stool for 48 hours
<ul> <li>E. coli 0157</li> </ul>	<ul> <li>diapered</li> </ul>		
Enteroinvasive E. coli	<ul> <li>leaking ost</li> </ul>	omy	
Entamoeba histolytica	<ul> <li>incontinen</li> </ul>	t	
Giardia lamblia	<ul> <li>unable to r</li> </ul>	erform hand	
Norovirus	hygiene af	er toileting	
Salmonella sp		-	
Shirella/enteroinvasive E. co	// Otherwise – s	tandard	
Shig-like toxin producing E.c.	oli precautions		
Herpes simplex virus –	Contact if extensi	ve or disseminated Any patient wi	thout: All lesions dry & crusted
cutaneous or mucocutaneous	Standard <sup>®</sup> if local	zed • immunosup	ression*
Hernes simplex virus - encenha	litis Standard	Any nationt	· ·
Herper simplex visus - localizer	d Standard	Any actient	
nerpes simplex virus - localized	a stantiarti	Any patient	
	<b>a</b>		
Hepatitis A	Contact if:	Any patient wi	th: One week after onset of
	<ul> <li>Diapered</li> </ul>	<ul> <li>Hep A immu</li> </ul>	nity positive IgG Illness (jaundice or peak
	<ul> <li>leaking ostomy</li> </ul>	or receipt of	2 doses of vaccine transaminases)
	<ul> <li>incontinent</li> </ul>	Who is not:	
	<ul> <li>incontinent</li> <li>unable to perfor</li> </ul>	Who is not: m hand hygiene • immunosup	pressed*

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# **Targeted MDROs**

Suspect, confirmed infection	Isolation type	Who may be cohorted	When to discontinue bolt tion
ice	Contact	Any patient	24 hours after initiation of therapy
ADRO (Multi-Drug Resistant Organisms) ARSA (Methicillin-resistant Staphylococcus aureus)	Contact if: • draining wounds • ventilator • tracheostomy Otherwise, standard	<ul> <li>Any patient without:</li> <li>immunosuppression*</li> <li>a central venous catheter</li> <li>a ventilator or tracheostomy</li> <li>an open surgical incision or non-</li> </ul>	<ul> <li>Drainage stops or contained by dressing, JP drain or wound VAC</li> <li>Patient extubated and secretions back to baseline e.g. suction new are minimal</li> </ul>
Measles	Airborne & Contact	Airborne isolation room • 4 days • Immur	after operation rash osuppressed*: duration of hospitalizati
VIENINDITIS - VIRAL NOST-SUIRDICAL	Standard	Any DATIENT	

## What is a Low-Risk Roommate??

- Private rooms very rare
- Matching MDRO patients very rare
- Any patient without:
  - Immunosuppression
  - A central venous catheter (invasive devices)
  - A ventilator or tracheostomy
  - An open surgical incision or non-intact skin

## **Traditional Surveillance**



• We missed transmission events

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• Is this a "cluster" or just endemic state?

# New Era of Epidemiology

- Implemented SatScan/WhoNet in 2015 with changes in CP (software is free)
- Tested for about 2 years prior to launch
- Maps infections to patient rooms, alerts if "cluster" is detected
- Cluster defined differently based on organisms and location, we set these alert threshold levels
- Co-Implemented Molecular Epidemiology Lab, establishing library of organisms and DNA patterns
  - Enables us to compare isolates between patients to look for links in clusters of cases
- Analysis is run daily automated

## **Cluster Detection**

- Changed from rule-based to transmission-based prospective cluster assessment
  - Phase 1 prospective detection of clusters
  - Phase 2 sequencing isolates to determine if they are related
  - Phase 3 traditional epidemiology "detective work" when isolates found to match

## **IPC Program Essentials**

- Success relies on excellent hand hygiene rates
- Excellent implementation of other infection control measures
- Keeping a close eye on bacteria in the hospital
- Data analyst(s) professional is very helpful

# MADE FOR NEW YORK.



## Main Lobby Entrance

550 First Avenue

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- Patients on Precautions a process measure to evaluate the impact of our changed approach
- What would you predict?
- Airborne Precautions Patients –
- Droplet Precautions Patients –
- Contact Precautions Patients –

- Patients on Precautions a process measure to evaluate the impact of our changed approach
- What would you predict?
- Airborne Precautions Patients no change
- Droplet Precautions Patients –
- Contact Precautions Patients –

- Patients on Precautions a process measure to evaluate the impact of our changed approach
- What would you predict?
- Airborne Precautions Patients no change
- Droplet Precautions Patients no change
- Contact Precautions Patients –

- Patients on Precautions a process measure to evaluate the impact of our changed approach
- What would you predict?
- Airborne Precautions Patients no change
- Droplet Precautions Patients no change
- Contact Precautions Patients decrease



• Let's see what happened

**JIC 20** 

## **NYUMC – TH Airborne Precautions Patient Days**

11/2013 - 4/2015 vs. 8/2015 - 4/2016 Rate: 0.51% vs. 0.47%, p = 0.71



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## **NYUMC – TH Droplet Precautions Patient Days**

11/2013 - 4/2015 vs. 8/2015 - 4/2016 Rate: 2.9% vs. 2.0%, p < 0.0001



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## **NYUMC – HJD Droplet Precautions Patient Days**

11/2013 - 4/2015 vs. 8/2015 - 4/2016 Rate: 0.11% vs. 0.16%, p < 0.52



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## **NYUMC - TH Contact Precautions Patient Days**

11/2013 - 4/2015 vs. 8/2015 - 4/2016 Rate: 9.0% vs. 4.6%, p < 0.0001



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## **NYUMC - HJD Contact Precautions Patient Days**

11/2013 - 4/2015 vs. 8/2015 - 4/2016 Rate: 1.8% vs. 0.68%, p = 0.0003



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TIONS

- Patients on Precautions a process measure to evaluate the impact of our changed approach
- Did you predict correctly?

**APIC 20**1(

- Airborne Precautions Patients no change
- Droplet Precautions Patients no change
- Contact Precautions Patients decrease

- HAI rates should measure whether changes made affect patient safety
- HAI Rates Data Parameters
  - Patient was in hospital greater than 3 days
  - Same-stay duplicates removed
  - 30 day readmission duplicates removed
  - p-value adjusted for community-acquired MDRO rates
  - Used acute inpatients, ED, and ED-observation only (hospice and rehab patients not counted)

- Organism Comparison
- VRE = *E. faecalis* & *E. faecium*
- *C. difficile* (PCR-based)
- MRSA
- Gram negative rod MDROs Carbapenem-resistant
  - Klebsiella pneumoniae, Klebsiella oxytoca, and Klebsiella species
  - Escherichia coli
  - Enterobacter aerogenes, Enterobacter cloacae, Enterobacter asburiae, and Enterobacter species
- Carbapenems

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• Ertapenem, Imipemen, Meropenem, and Doripenem

- MDRO Comparison
  - VRE rate –
  - C. difficile rate –
- MRSA, other MDRO rates
- What would you predict?





- MDRO Comparison
  - VRE rate control measure
  - C. difficile rate –
- MRSA, other MDRO rates





- MDRO Comparison
  - VRE rate control measure
  - *C. difficile* rate control measure
- MRSA, other MDRO rates





- MDRO Comparison
  - VRE rate control measure
  - *C. difficile* rate control measure
- MRSA, other MDRO rates let's see what happened





## NYUMC VRE Rates/1000 pt days 11/2013 - 04/2015 vs. 08/2015 - 04/2016 (94 vs. 62) p = 0.25



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## NYUMC *C. difficile* Rates/1000 pt days 11/2013 - 04/2015 vs. 08/2015 - 04/2016 (191 vs. 86) p = 0.14



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NYUMC MRSA Rates/1000 pt days 11/2013 - 04/2015 vs. 08/2015 - 04/2016 (114 vs. 77) p = 0.15



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## NYUMC MDRO - Kleb Rates/1000 pt days 11/2013 - 04/2015 vs. 08/2015 - 04/2016 (12 vs. 10) p = 0.32



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## NYUMC MDRO – *E. coli* Rates/1000 pt days 11/2013 - 04/2015 vs. 08/2015 - 04/2016 (1 vs. 3) p = 0.14



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## NYUMC MDRO-*Enterobacter* Rates/1000 pt days 11/2013 - 04/2015 vs. 08/2015 - 04/2016 (0\* vs. 2) p = 0.29

\* used a value of 1 to calculate the p-value



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# What Happened - Conclusions

- MDRO rates for MRSA, GNRs not changed
- Pre-Post study design has weaknesses
- Confounders are present Droplet Precautions rates
- Possible confounding variables
  - Antibiotic Stewardship
  - Environmental cleaning
  - Increasing census
  - Illness seasonality
  - Changes in patient population
- Other Limitations

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- small numbers of some MDRO isolates, low statistical power
- short duration of intervention period



# **Challenging Questions**

- Are we just creating a city of colonized patients?
- Won't colonization pressure lead to infection?
- We already have colonization in our communities
- Focus on basic practices excellent control of environment (e.g., cleaning) and hand hygiene
- Resource management where to spend time and \$





## **Challenges – Past, Present, Future**

- Difficult to change practices in a large facility
- Limits on education, its reach and effectiveness
- Practical application relies on clinician's assessment
- CP requires good staff compliance, technique
- Maintaining patient safety when changing paradigms
- Patient / Family perceptions

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• Wider Community / Regulatory acceptance



 Make clinical environment hard-wired to do right – for patient care, environmental cleaning, HAI prevention





- Think outside the box what is working, what needs to change to make your facility efficient and safe
- Evaluate effectiveness of current program
- Look for opportunities to make positive change
- Work with stakeholders (inside and beyond your facility)
- Validate impact of changes made may require leap of faith but have measurement tools functioning
- Dare to be ruthless about making steaks from sacred cows



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## **Thank You!**

**Questions?** 





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