

# Managing MDRO's in LTC: Strategies across care transitions

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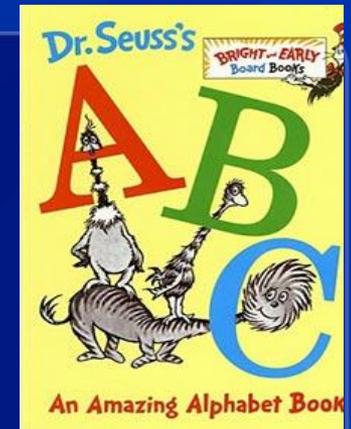
# Presentation Outline

- ❑ **Describe the changing resident population and the growing problem of MDRO prevention in long-term care facilities**
- ❑ **Understand the basics about multidrug-resistant organisms (MDROs) and how they emerge and spread in healthcare facilities**
- ❑ **Understand the strategies to address the emergence/spread of multidrug-resistant organisms (MDROs) in LTC.**
- ❑ **Provide examples of applying these prevention strategies to address specific HAI's such as C. difficile and CA-UTI.**

# Defining Multidrug-resistance

- ❑ Resistant to treatment by several antibiotics from unrelated classes
- ❑ Sometimes just one key drug resistance will define an important MDRO, for example, Methicillin-resistance in Staph aureus
- ❑ Sometimes bacteria acquire resistance to several classes, often seen in gram negative rods
  - ❑ Cephalosporin-resistance is a big concern in bacteria like E coli/Klebsiella which often cause UTIs
  - ❑ Pseudomonas will be resistant to fluoroquinolones, penicillins, cephalosporins, and carbapenems

# ABC's of MDROs



<b>Bacteria</b>	<b>Abbrev.</b>	<b>Antibiotic Resistance</b>
Staphylococcus aureus	MRSA	Methicillin-resistant
Enterococcus (faecalis/faecium)	VRE	Vancomycin-resistant
Enterobacteriaceae (E coli/Klebsiella, etc)	CRE (KPC)	Carbapenem-resistant
Pseudomonas/ Acinetobacter	MDR	Many drug classes

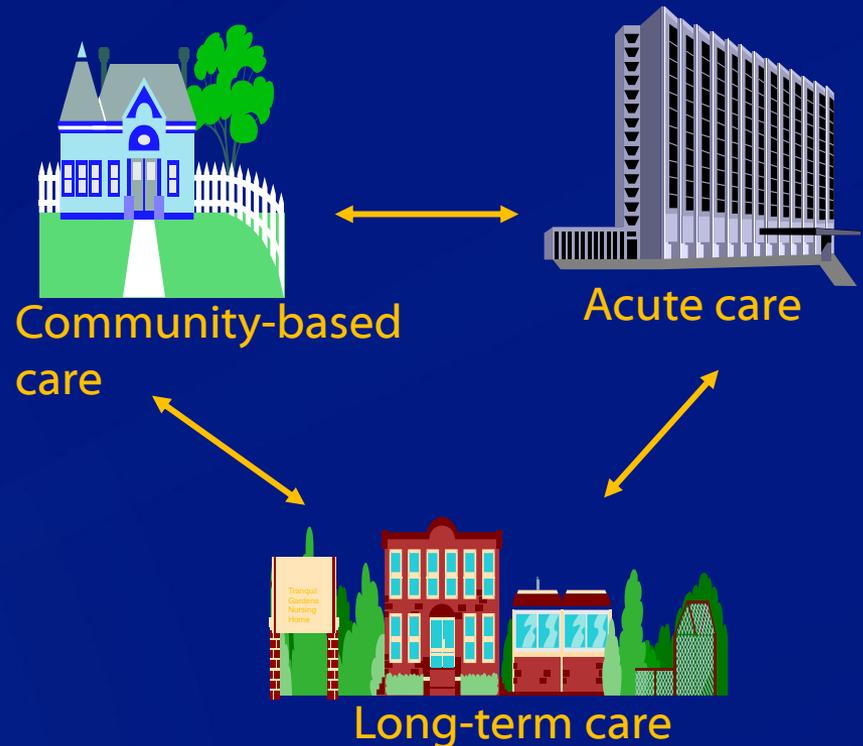
# Growing complexity in the LTC resident population

## □ Increasing post-acute care population

- Growing medical complexity and care needs
- Increasing exposure to devices, wounds and antibiotics
- High prevalence of multidrug-resistant organisms

## □ Dynamic movement across healthcare settings

- Impacts where healthcare-associated infections manifest



# Changing population in NHs

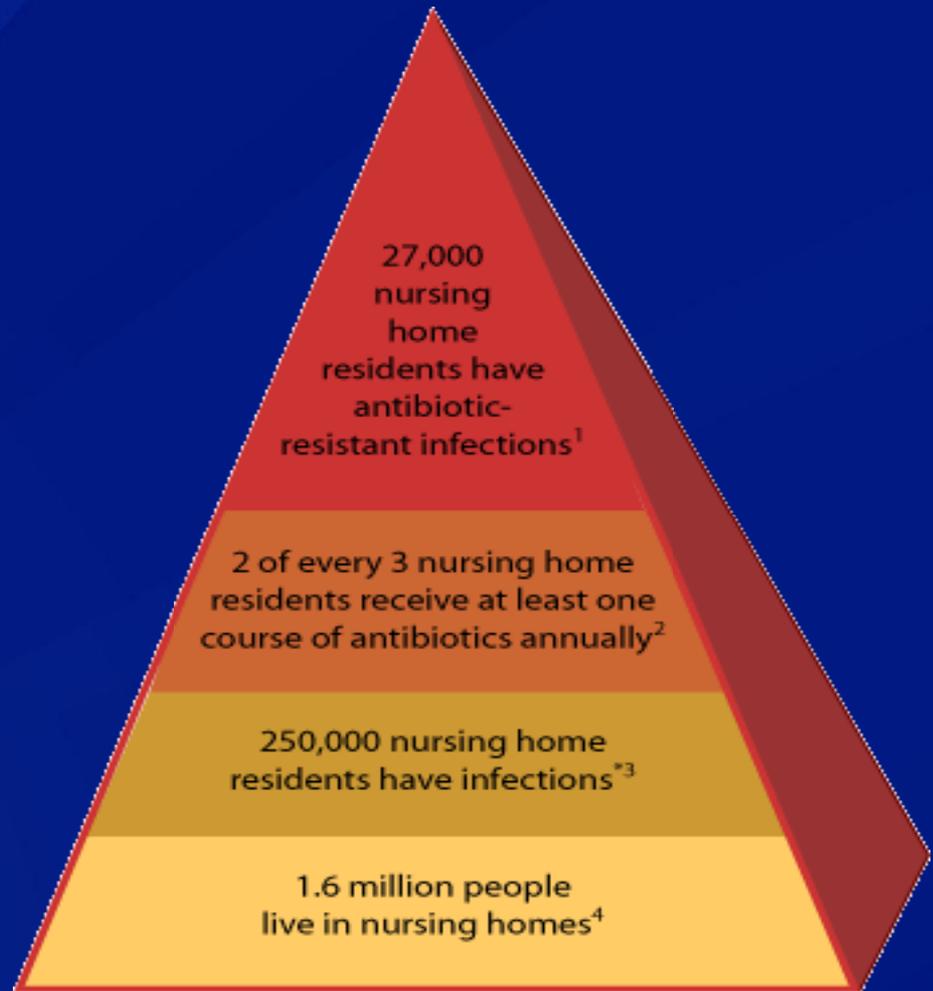
- 3.2 million residents received care in 15, 956 certified NH/SNF in the US in 2008
  - Acute care hospitals are the primary source of new admissions
- From 1999 to 2008
  - 16% decrease in the number of nursing home beds/ 1000 residents of US population;
  - 10% increase in the number of residents cared for in LTC
  - Increasing proportion of individuals under the age of 65 are receiving care in LTCFs (13.6% in 2008)
  - **Growing post-acute care population as custodial care shifts to assisted-living**

# Medical Services Provided in US NHs

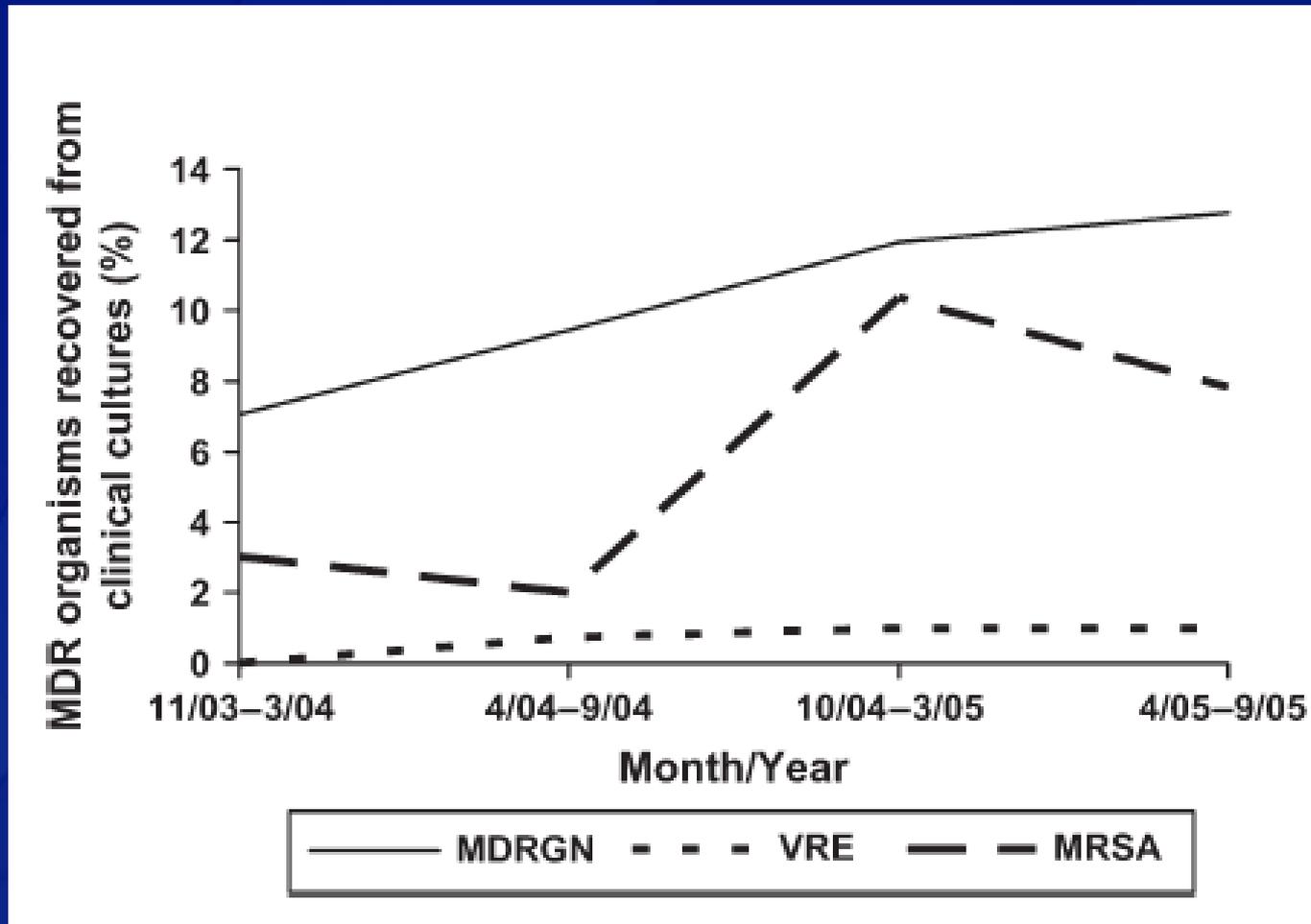
Resident Service provided	N=146
Skilled nursing/short-term rehabilitation	96%
IV infusions using central lines	75%
Management of residents w/ tracheostomy	46%
Management of residents on ventilators	5%
Dedicated staff to provide blood draws	71%
Dedicated staff to provide wound care	94%

# Antimicrobial use in NHs

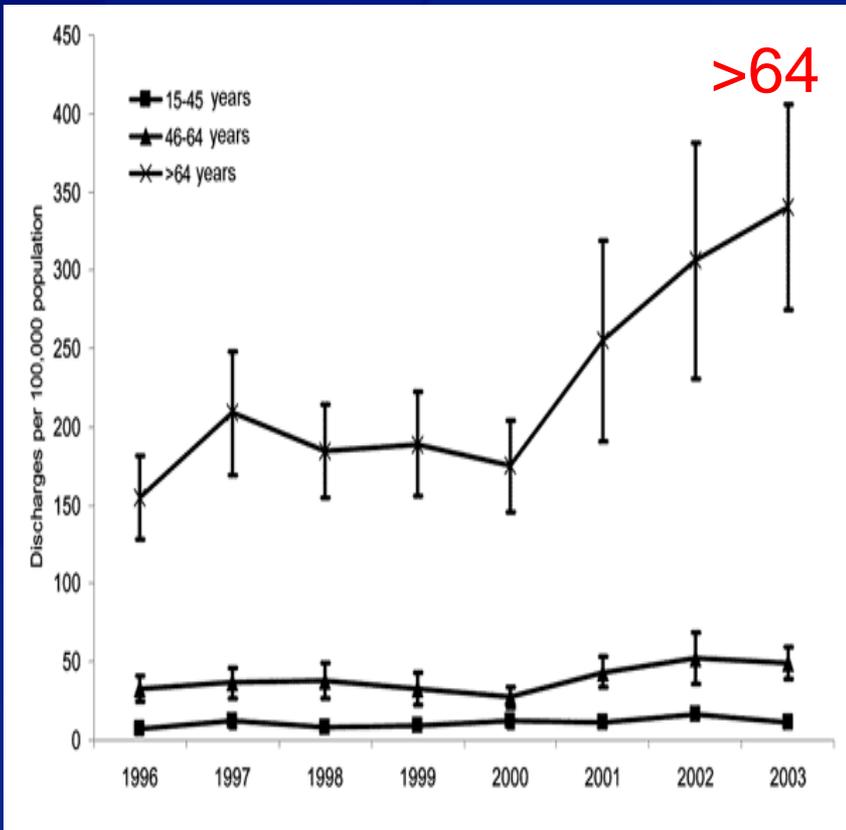
- ❑ Antimicrobials are the most frequently prescribed drug class
  - Comprise 40% of all prescriptions
  - 50-70% of residents will receive an antimicrobial during the year
- ❑ 25-75% of antimicrobial use may be inappropriate



# Epidemiology of multidrug-resistance in NHs



# C. difficile Infection in NHs



## Annual Estimates

Category	# Cases	Excess costs	Deaths
Hospital-onset	165K	\$1.3 B	9,000
Community-onset, HCF-associated	50K	\$0.3 B	3,000
Nursing home-onset	263K	\$2.2 B	16,500

**McDonald LC et al Emerg Infect Dis 2006;12**

Dubberke et al. Clin Infect Dis. 2008;46:497-504

Dubberke et al. Emerg Infect Dis. 2008;14:1031-8

Elixhauser et al. HCUP Statistical Brief #50. 2008

# VA NHAH point prevalence, 2007

- 575 residents with HAI/10,939 residents
- 24.6% of residents had at least one indwelling device
  - 36% urinary catheters
  - 18% PEG tubes
  - 11.5% PICC lines
- 613 infections
  - 29% symptomatic UTI
  - 18% skin/soft tissue
  - 8% pneumonia
  - 8% GI tract
- Residents with devices carried 2.8-fold higher risk of an infection

# HAI Prevention Resources in NHs

Current HAI prevention resources	N=141
24-hour a day on-site supervision by an RN	45%
Person coordinating Infxn prevention is trained	40%
Infxn prevention is full-time position	28%
Time spent on infection control (in 40-hour week)	58%

- ❑ **HAI challenges: MRSA (21%); C. diff Infections (19%); Catheter-assoc. UTI (12.5%);**
- ❑ **IC challenges: Surveillance (26%); MDRO management/ Isolation (20%); Hand Hygiene (18%)**

# Case of an emerging MDRO....

Clinical Infectious Diseases 2010;50(12):1611–1616

MAJOR ARTICLE

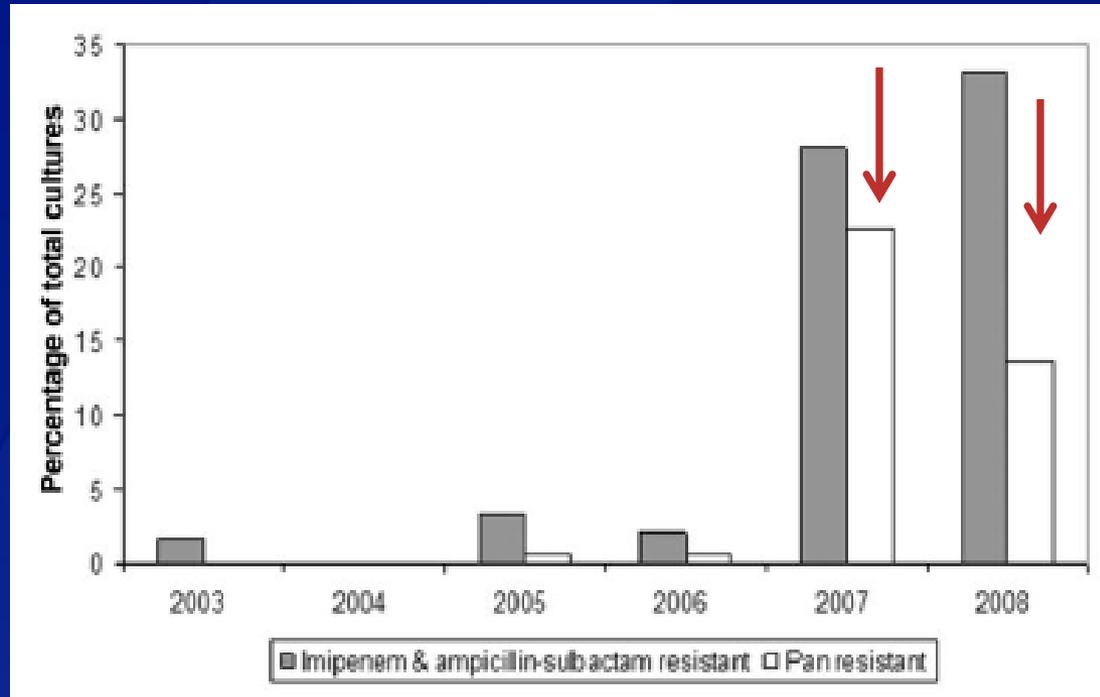
## Multidrug-Resistant *Acinetobacter baumannii*: An Emerging Pathogen among Older Adults in Community Hospitals and Nursing Homes

D. M. Sengstock,<sup>1,2</sup> R. Thyagarajan,<sup>1,2</sup> J. Apalara,<sup>1</sup> A. Mira,<sup>1</sup> T. Chopra,<sup>2</sup> and K. S. Kaye<sup>2</sup>

<sup>1</sup>Internal Medicine/Geriatrics, Oakwood Hospital, Dearborn, and <sup>2</sup>Department of Internal Medicine, Wayne State University, Detroit, Michigan

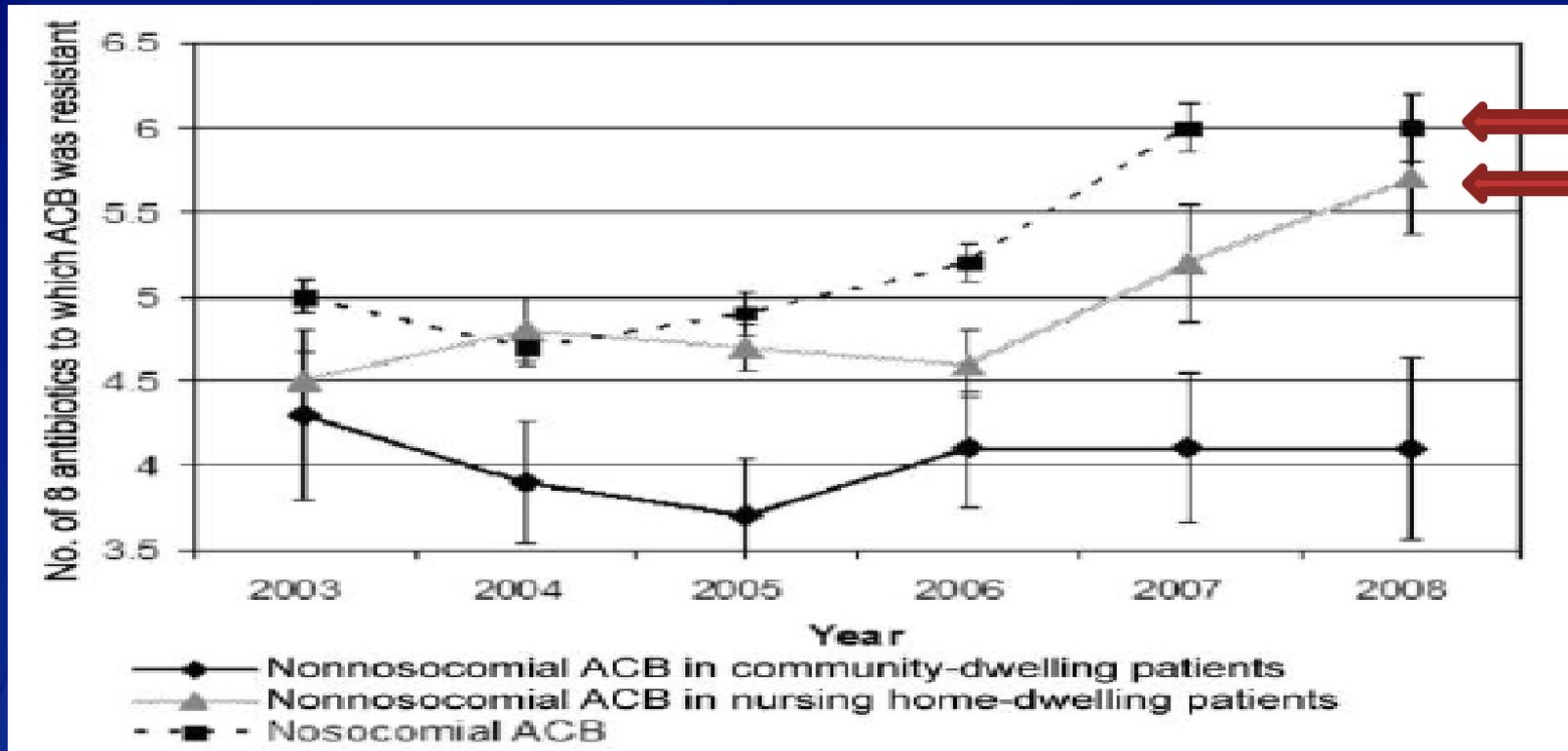
- ❑ Lab examined all the *Acinetobacter* cultured from people at 4 local hospitals over 5 years
- ❑ Classified as hospital-associated, NH-associated, or community-associated
- ❑ Wanted to see how antibiotic resistance emerged in this community

# Multidrug-resistance emerged quickly



- ❑ Over 5 year period, antibiotic resistance increased dramatically
  - ❑ In the last 2 years of the study pan-resistant bacteria emerged
- ❑ Culture sources: Respiratory secretions (56%); Wounds (22%); Urine (12%)

# Healthcare facilities are the source of MDROs



- ❑ All the highly resistant bacteria were coming from patients in the hospital or those in the nursing homes – NOT from people living at home

# Critical message about care transitions

The increase in prevalence of *Acinetobacter* strains in nursing homes and the degree of antibiotic resistance among these strains is extremely concerning. As the current study demonstrates, the degree of antibiotic resistance among “hospital-acquired” *Acinetobacter* cultures increased during the study period in parallel with the degree of resistance among *Acinetobacter* isolates from nursing home-dwelling patients. The epidemiology of *Acinetobacter* infection among older adults in this study indicates the existence of a hospital–nursing home “coupling.” This coupling supports a continuous circuit that nurtures the dissemination of multidrug-resistant *Acinetobacter* strains among both types of health care facility. Consequently, coordinated regional efforts are needed to control the spread of this pathogen. Long-term care facilities, despite their vulnerable populations, generally have few resources for infection surveillance and prevention.

# MDROs in the healthcare setting

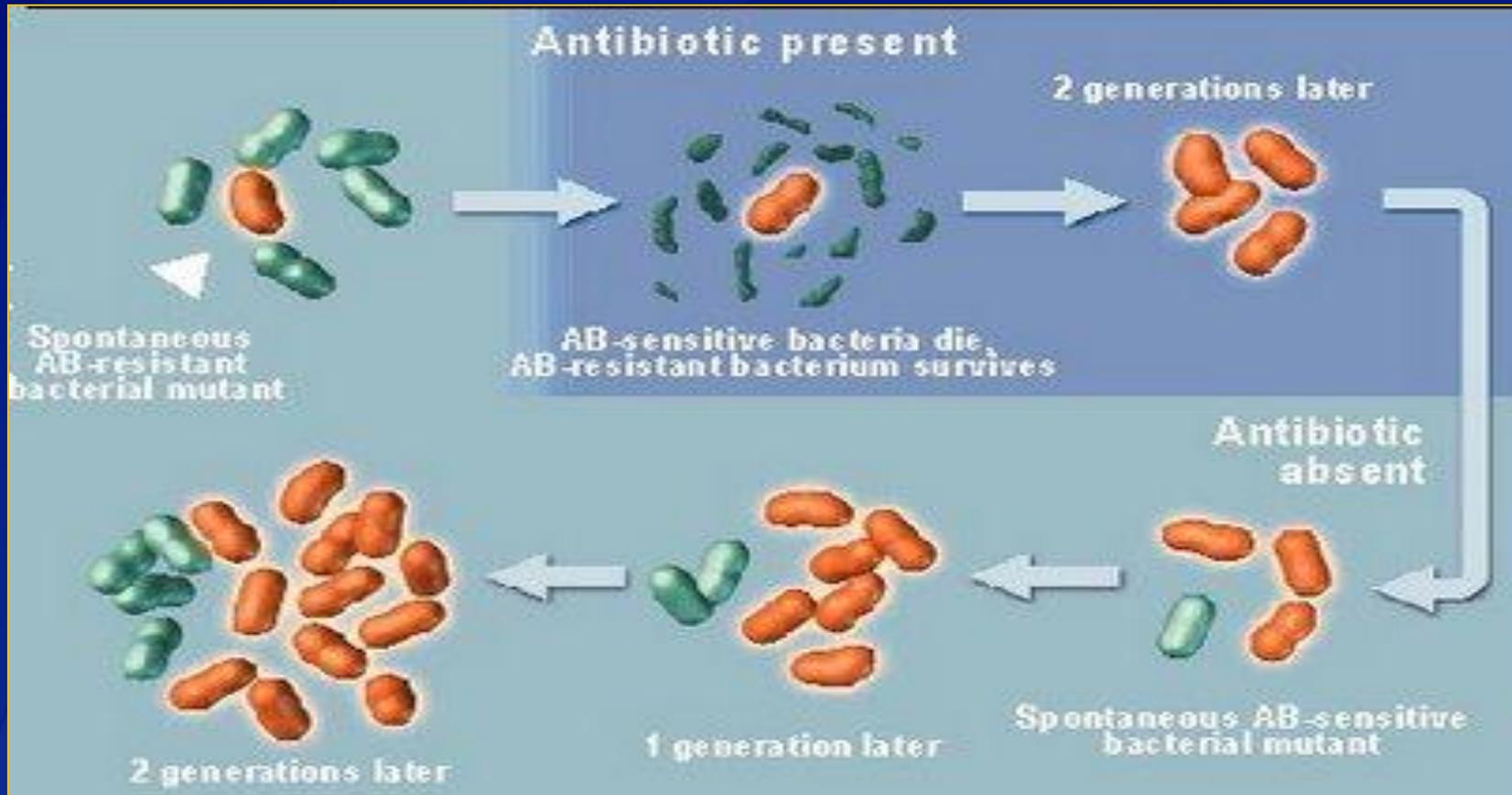
## DEVELOPMENT

- ❑ Antibiotic pressure
  - ❑ Most common predictor of antibiotic resistance is prior exposure
- ❑ Device utilization
  - ❑ Biofilm formation on central lines, urinary catheters, etc.

## SPREAD

- ❑ Patient to patient transmission via healthcare workers
- ❑ Environmental / equipment contamination
- ❑ Role of colonization pressure on acquisition

# Resistance from antibiotic pressure



- ❑ At first most of the bacteria can be killed by the drug (green)
- ❑ But, once they are wiped out, the resistant bugs take over (red)

# Antibiotic use drives resistance

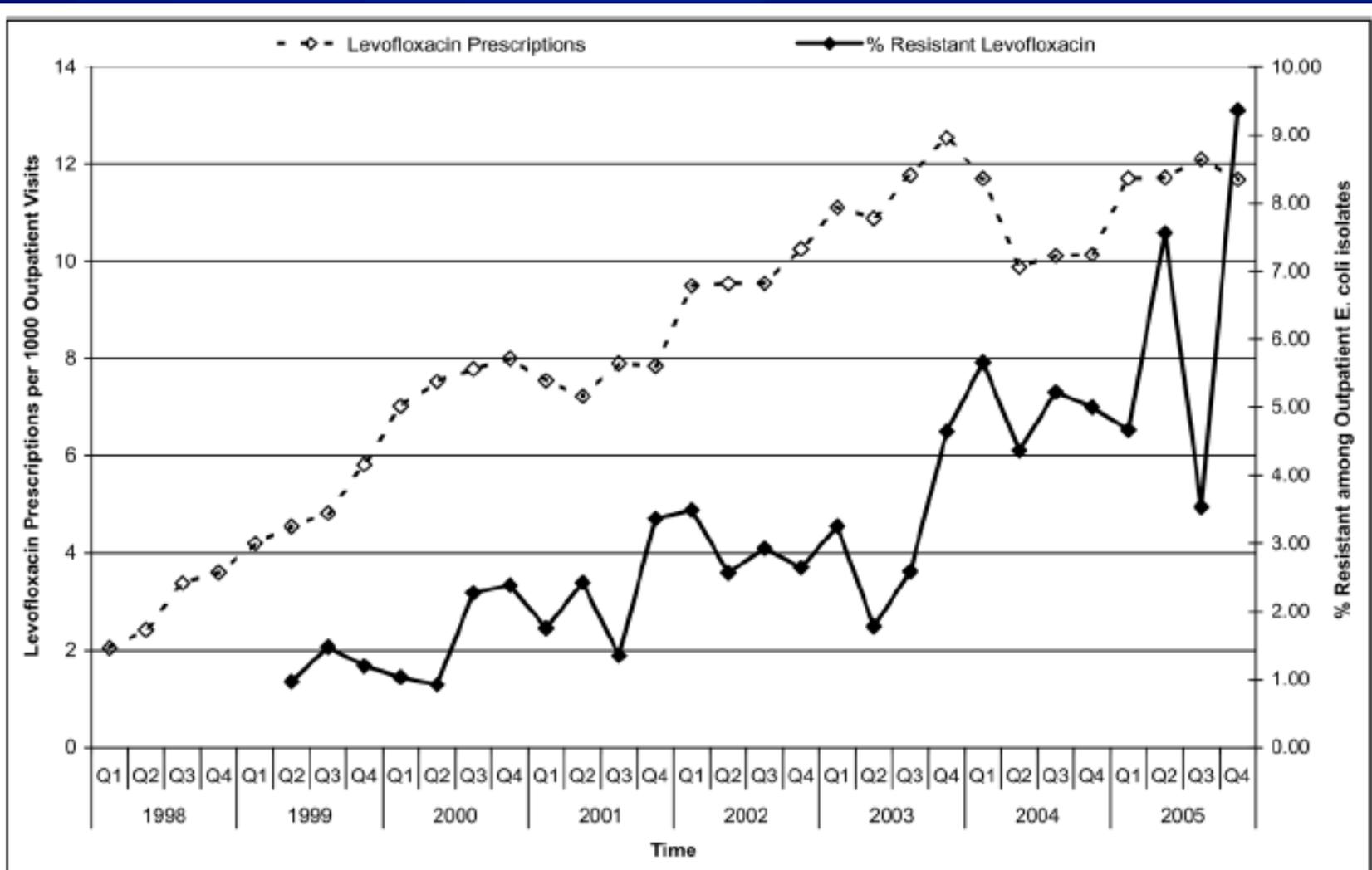
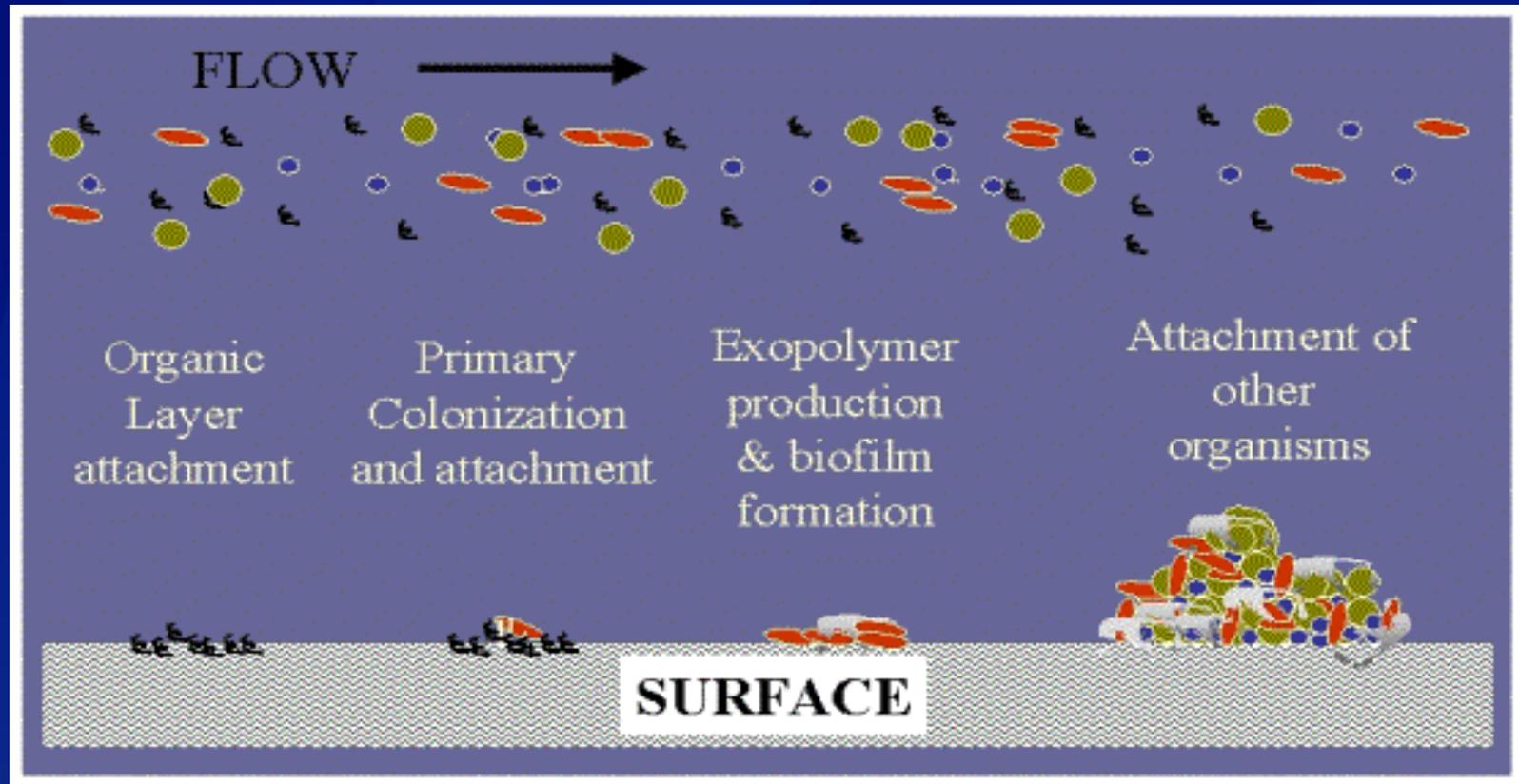


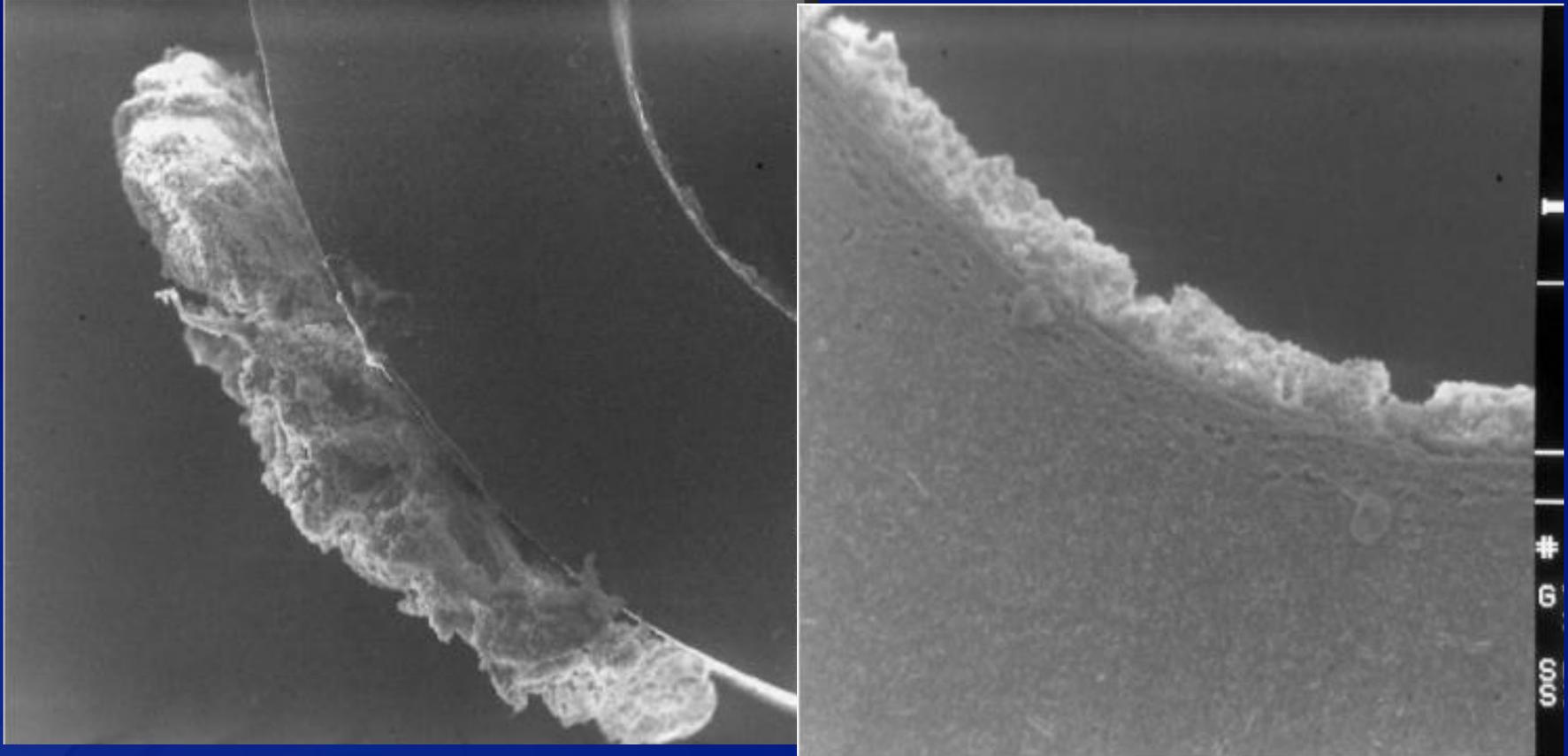
Figure 1 Levofloxacin use and outpatient *Escherichia coli* resistance to levofloxacin versus time.

# Biofilm formation on device surfaces



- Biofilm: An collection of bacteria within a sticky film that forms a community on the surface of a device

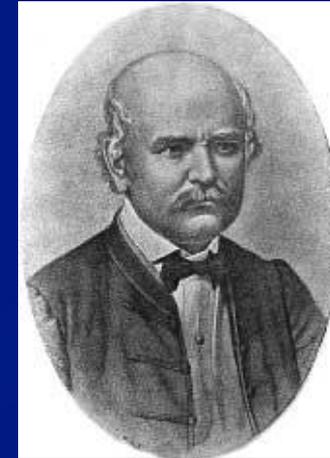
# Biofilm on an indwelling catheter



# Resistance develops within biofilms

- ❑ Bacteria within a biofilm are grow every differently from those floating around freely
  - ❑ These changes in their growth make our antibiotics less effective
- ❑ Antibiotics can't penetrate the biofilm to get to the bacteria
  - ❑ This leads to much less drug available to treat the bugs
- ❑ Bacteria within the biofilm can talk to each other and share the traits that allow some to be resistant
  - ❑ Over time more and more of them become resistant as well

# Improved Patient Outcomes Associated with Hand Hygiene



Ignaz Philipp  
Semmelweis  
(1818-1865)

**Chlorinated Lime Hand Antisepsis**



Patient Safety

\*\*\*WORLDWIDE GUIDELINE TO PREVENTION\*\*\*

# CLEAN HANDS SAVE LIVES

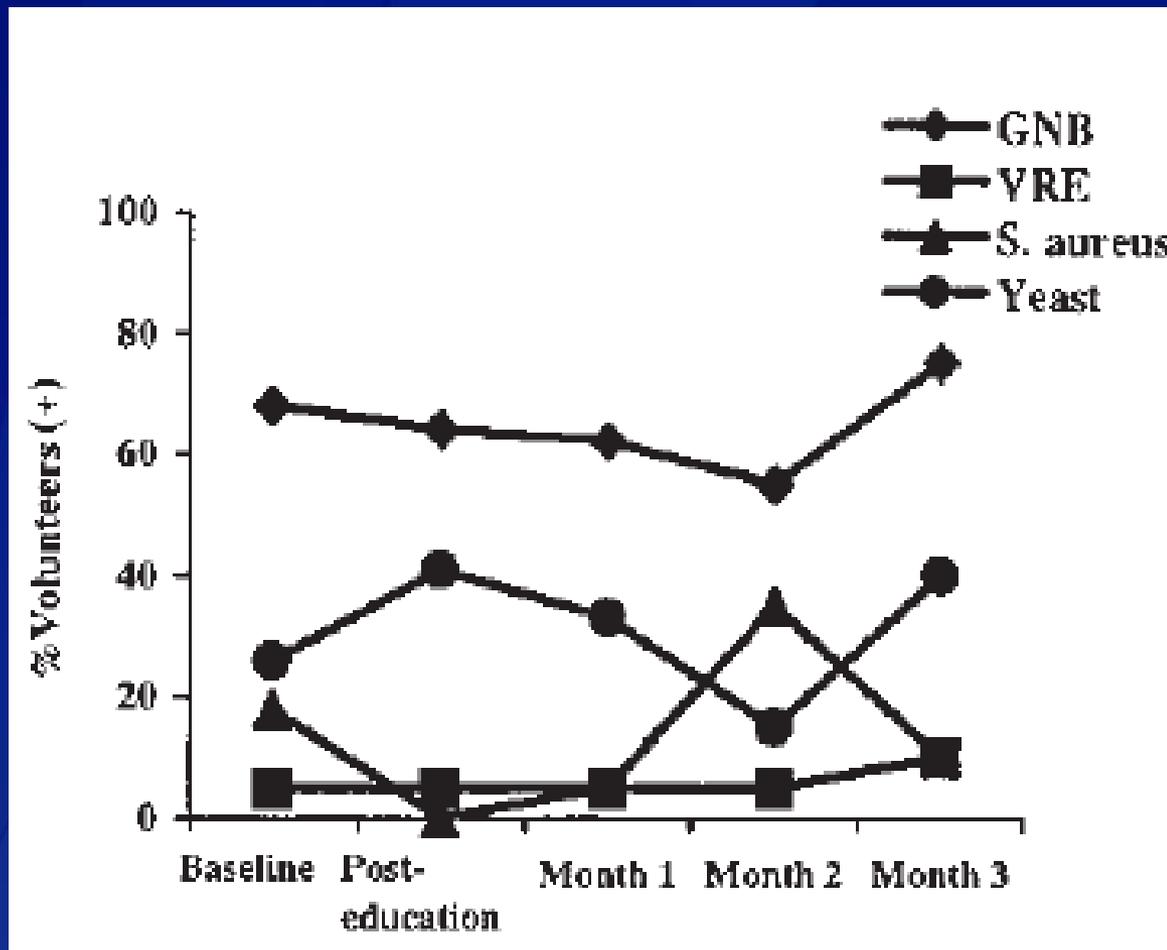
## Protect patients, protect yourself



Alcohol-rub or wash  
before and after **EVERY** contact.



# Bacterial contamination of HCW hands prior to hand hygiene in a LTCF



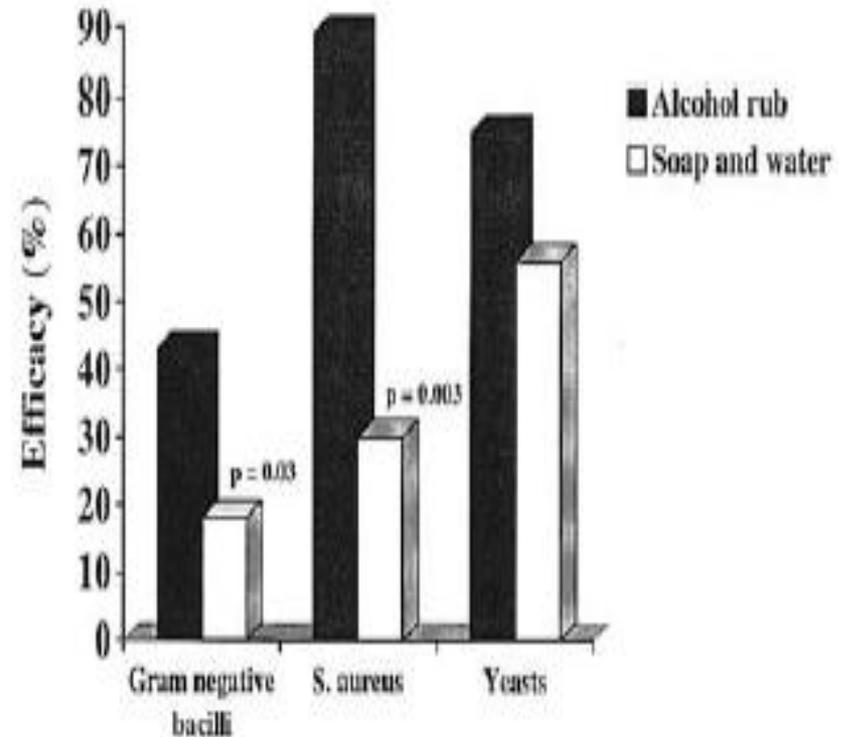
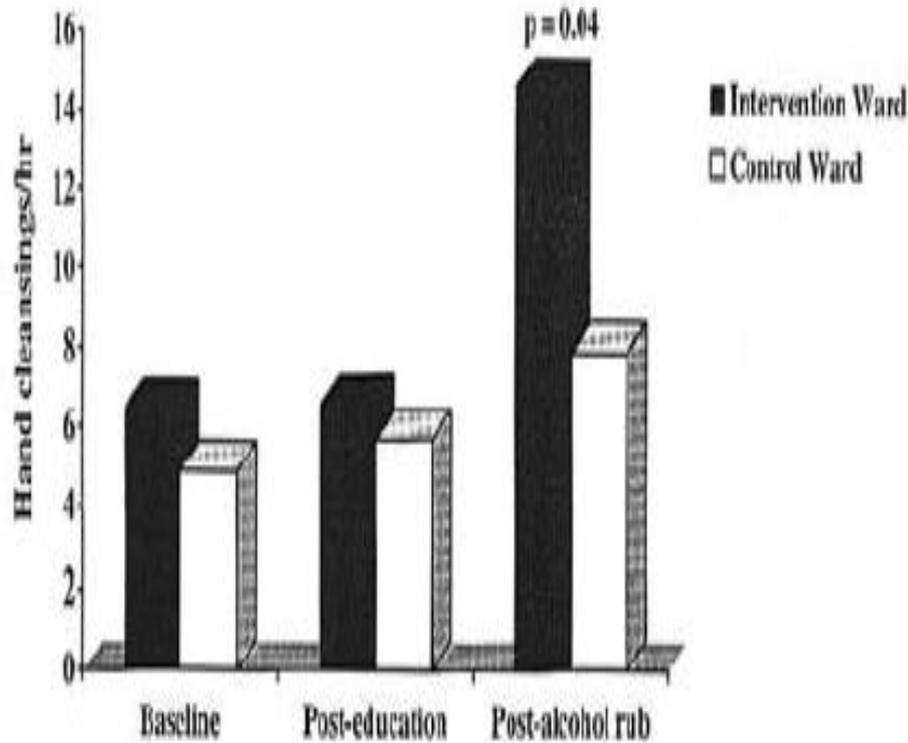
- Gram negative bacteria were the most common bugs cultured from hands of staff
- Most Gram neg. bacteria live in the bowls or colonize the urine!!!

# Hand Hygiene

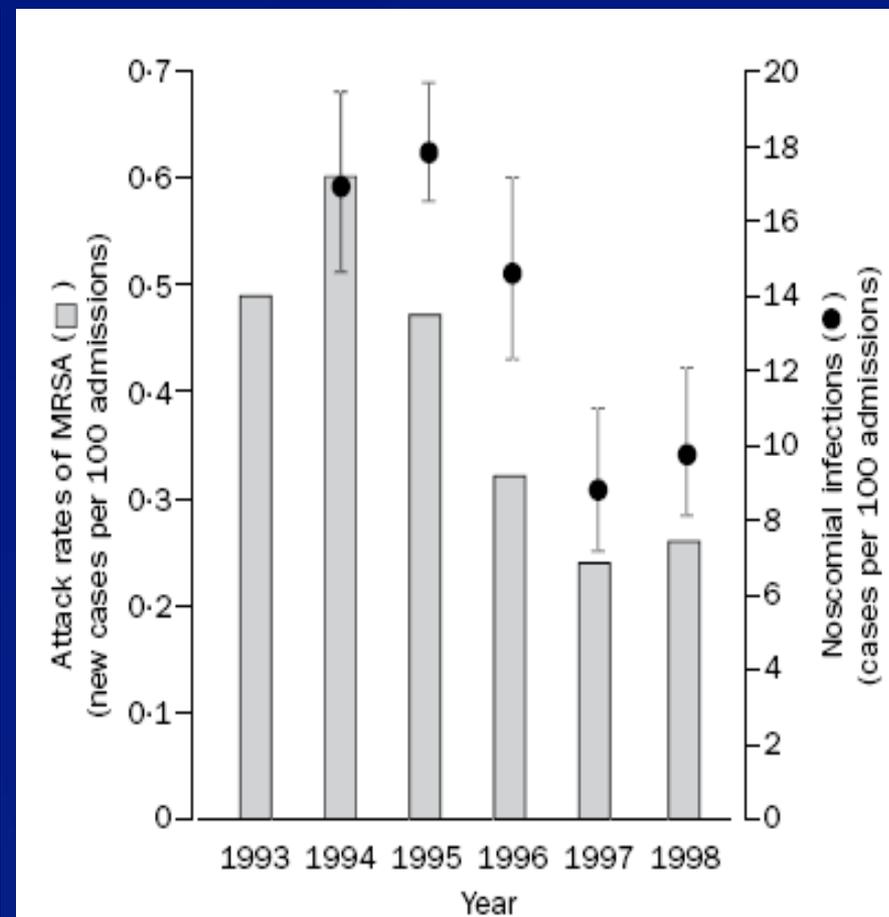
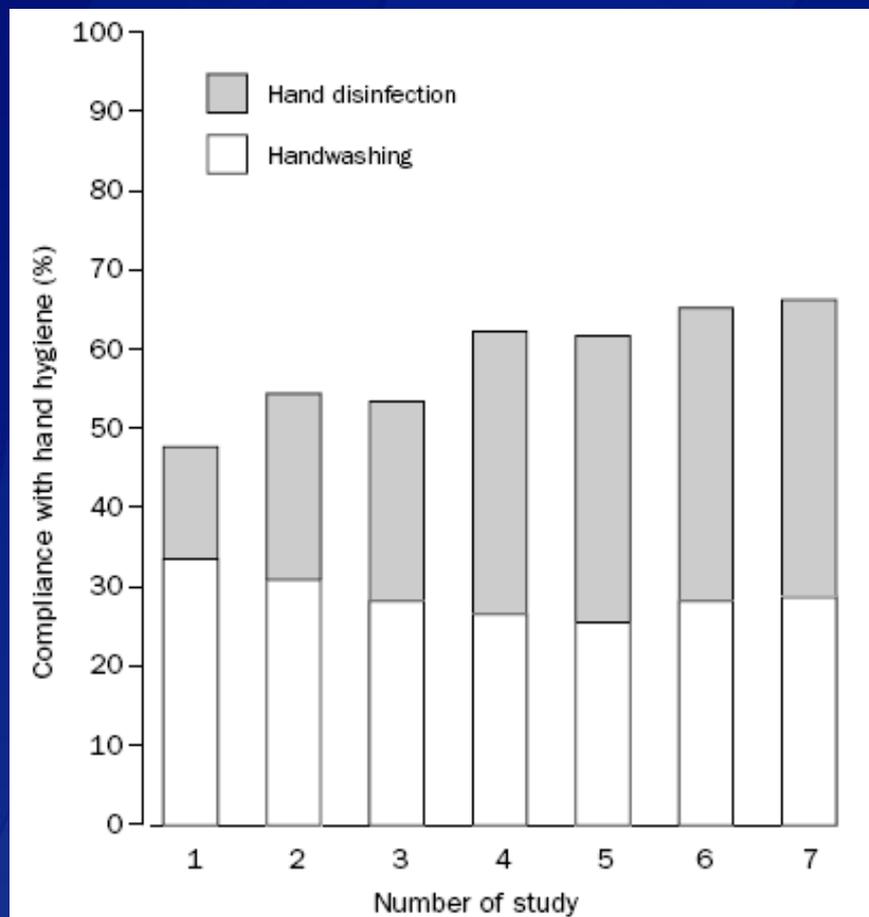
- ❑ Most effective and least costly means of preventing the transmission of MDROs
- ❑ Yet, compliance still ranges between ~30-60%



# Alcohol-based hand rub improves compliance and decontamination



# Decreased MRSA infections associated with increased hand hygiene compliance





REVIEW

# The role of environmental cleaning in the control of hospital-acquired infection

S.J. Dancer\*



# The invisible reservoir of MDROs



**X marks the locations where VRE was isolated in this room**

- Image from Abstract: The Risk of Hand and Glove Contamination after Contact with a VRE (+) Patient Environment. Hayden M, ICAAC, 2001, Chicago, IL.

Slide courtesy of Teresa Fox, GA Div PH

# Duration of environmental contamination by MDROs

Pathogen	Survival	Data Strength	Transmission Settings
<i>C difficile</i>	Months	3+	Healthcare facilities
MRSA	Days-weeks	3+	Burn units
VRE	Days-weeks	3+	Healthcare – higher risk areas
<i>Acinetobacter</i>	33 days	2/3+	Wet or dry environments
<i>Pseudomonas aeruginosa</i>	7 hours	1+	Wet environments

Adapted from Hota. *Clin Infect Dis*. 2004;39:1182-1189.

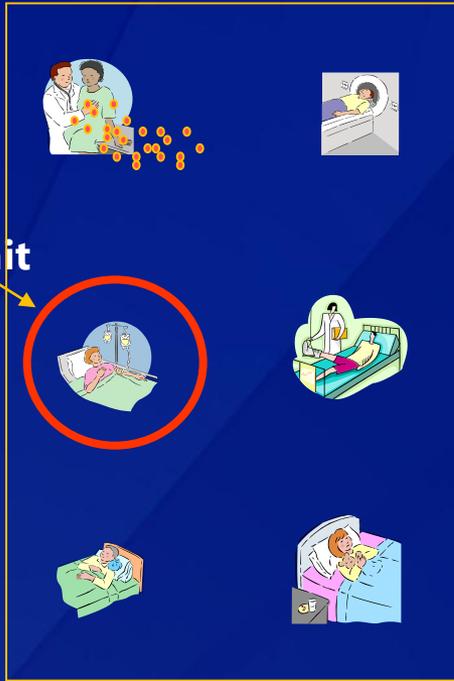
# Colonization pressure on risk of acquisition

- ❑ Colonization pressure: Presence of other MDRO carriers on a unit will increase the risk of MDRO acquisition to a non-carrier close by
- ❑ Studies have demonstrated the impact of colonization pressure on acquisition of MRSA, VRE and CDI
- ❑ Both asymptomatic carriers (colonized) and actively infected individuals can be a source for transmission (spread) on a unit

Williams VR et al. Am J Infect Control. 2009 Mar;37(2):106-10  
Bonten MJ et al. Arch Intern Med. 1998 May 25;158(10):1127-32.  
Dubberke ER et al. Arch Intern Med. 2007 May 28;167(10):1092-7

# Colonization pressure: CDI example

CDI pressure  
= 1 × days in unit



Unit A

Fewer patients with active CDI  
= lower risk of acquiring CDI

CDI pressure  
= 5 × days in unit



Unit B

More patients with active CDI  
= higher risk of acquiring CDI

# Key MDRO Prevention Strategies

- ❑ Assessing hand hygiene practices
- ❑ Implementing Contact Precautions
- ❑ Recognizing previously colonized patients
- ❑ Rapidly reporting MDRO lab results
- ❑ Strategically place residents based on MDRO risk factors
- ❑ Careful device utilization
- ❑ Antibiotic stewardship
- ❑ Inter-facility communication

# Assessing Hand Hygiene

- Hand hygiene should be a cornerstone of prevention efforts
- As part of a hand hygiene intervention, consider:
  - Ensuring easy access to soap and water/alcohol-based hand gels
  - Observation of practices - particularly around high-risk situations (before and after contact with colonized or infected patients)
  - Feedback – “Just in time” feedback if failure to perform hand hygiene observed

# Implementing Contact Precautions

- Involves use of gown and gloves for patient care
  - Don equipment prior to room entry
  - Remove prior to room exit
- Selective roommate placement for MDRO colonized/infected individuals
- Observation of practices - particularly around high-risk situations
- Use of dedicated non-essential items may help decrease transmission due to contamination
  - Blood pressure cuffs; Stethoscopes; IV poles and pumps

# Recognizing Prior Colonization

- ❑ Individuals can be colonized with MDROs for months
- ❑ Being able to identify previously colonized or infected individuals allows for application of appropriate interventions in a timely fashion
- ❑ Being an MDRO carrier should not prevent a resident from being admitted to a LTCF,
  - ❑ Knowledge allows us to plan for them to have the safest care
  - ❑ For every resident carrying an MDRO that we know about, there are probably 3 others we don't know

# Strategic placement of residents based on risk factors

- Base new roommate assignments on resident characteristics
  - Wounds, devices, current antibiotics, incontinence are all risks for being an MDRO carrier or acquiring a new MDRO
  - Try to avoid placing two high risk residents together
- Don't necessarily change stable room assignments just because of a new culture result unless it now poses new risk
  - Roommates who've been together for a long time have already had opportunity to share organisms in the past (even if you only learned about it recently)

# Prompt Recognition of MDROs in Laboratory Reports

- Facilities should have a mechanism for rapidly communicating positive MDRO lab results to clinical area
  - Allows for rapid initiation of interventions on newly identified MDRO carriers
- Consider implementing precautions while waiting for results from the lab if an MDRO is possible
  - For example, contact precautions for a resident with diarrhea while waiting for results of a C diff stool study

# Careful Device Utilization

- Know the population of residents with indwelling medical devices
  - May require focused infection surveillance
- Continually assess the ongoing need for devices
  - Develop a bladder protocol for urinary catheter removal
  - Resist the temptation to retain IV lines beyond the duration of treatment “just in case”
- Ensure staff are comfortable and trained on handling/maintenance of medical devices

# Antibiotic Stewardship

- Careful antibiotic use is a critical component in the control of MDROs
- Know the frequency/indications for antibiotic use by medical providers in your facility
  - Apply criteria to assess utilization in a standard way
- Develop standard protocols for communicating concerns and assessing residents who are suspected to have an infection between nursing and medical staff
  - Ensure documentation of signs/symptoms is complete

# Case study on care transitions

- ❑ A LTC resident was transferred to a local ED with worsening lower extremity swelling and shortness of breath
  - ❑ Resident's history included coronary heart disease, Diabetes with neuropathy, enlarged prostate
- ❑ Diagnosed with worsening heart failure admitted to ICU for cardiac monitoring and fluid management
- ❑ A urinary catheter was placed at the time of admission and a specimen was sent for UA/culture in ED.
  - ❑ Based on the UA, the patient was started on antibiotics

# Case study (continued)

- ❑ After treatment for heart failure and the positive urine culture, the resident was discharged backed to the LTC facility with the catheter in place.
- ❑ Prior to removing the urinary catheter a repeat culture was sent which grew VRE
  - ❑ A second course of antibiotics was initiated
- ❑ Two weeks later the resident developed diarrhea and fever
  - ❑ Stool sample was positive C. Diff toxin test.

# Issues raised by our case

- ❑ Is the practice of screening urine cultures on admission a valuable strategy?
  - ❑ What are the pros/cons
- ❑ Did the resident continue to need the urinary catheter once the CHF was managed?
  - ❑ How is resident functionality communicated at time of transfer
- ❑ How are antibiotics used in both acute/LTC facilities in this shared population?
  - ❑ Who is accountable for the complications of antibiotic use?

# Inter-facility Communication

- Mechanism for communicating MDRO carriage and other risk factors at time of transfer between facilities
- Critical components:
  - MDRO history of current infection or carriage
  - Device utilization
  - Current antibiotic treatments (indication/duration)
  - Bedside care issues (wounds, continence, etc)

Original concept and form developed by Utah HAI Working Group/ Courtesy of Utah State Dept of Health.

## Inter-facility Infection Control Transfer Form

This form must be filled out for transfer to accepting facility with information communicated prior to or with transfer  
*Please attach copies of latest culture reports with susceptibilities if available*

**Sending Healthcare Facility:**

Patient/Resident Last Name	First Name	Date of Birth	Medical Record Number
		_ / _ / _	

Name/Address of Sending Facility	Sending Unit	Sending Facility phone

Sending Facility Contacts	NAME	PHONE	E-mail
Case Manager/Admin/SW			
Infection Prevention			

Is the patient currently in isolation?     NO     YES  
 Type of Isolation (check all that apply)     Contact     Droplet     Airborne     Other: \_\_\_\_\_

Does patient currently have an infection, colonization OR a history of positive culture of a multidrug-resistant organism (MDRO) or other organism of epidemiological significance?	Colonization or history <i>Check if YES</i>	Active infection on Treatment <i>Check if YES</i>
Methicillin-resistant Staphylococcus aureus (MRSA)		
Vancomycin-resistant Enterococcus (VRE)		
Clostridium difficile		
Acinetobacter, multidrug-resistant*		
E coli, Klebsiella, Proteus etc. w/Extended Spectrum B-Lactamase (ESBL)*		
Carbapenemase resistant Enterobacteriaceae (CRE)*		
Other:		

**Does the patient/resident currently have any of the following?**

- |   |  |
|---|--|
| <input type="checkbox"/> Cough or requires suctioning<br><input type="checkbox"/> Diarrhea<br><input type="checkbox"/> Vomiting<br><input type="checkbox"/> Incontinent of urine or stool<br><input type="checkbox"/> Open wounds or wounds requiring dressing change<br><input type="checkbox"/> Drainage (source) _____ | <input type="checkbox"/> Central line/PICC (Approx. date inserted ___/___/___)<br><input type="checkbox"/> Hemodialysis catheter<br><input type="checkbox"/> Urinary catheter (Approx. date inserted ___/___/___)<br><input type="checkbox"/> Suprapubic catheter<br><input type="checkbox"/> Percutaneous gastrostomy tube<br><input type="checkbox"/> Tracheostomy |
|---|--|

Is the patient/resident currently on antibiotics?     NO     YES:

Antibiotic and dose	Treatment for:	Start date	Anticipated stop date

# Clostridium difficile

- Gram positive rod which grows best without oxygen (anaerobic)
- C. diff has a special growth characteristic called "spores"
  - Hard outer shells in which sleeping bacteria can survive in the environment for long periods
- Spores are shed in large numbers during the diarrhea caused by C diff infection (CDI)



# Steps to C. diff Infection (CDI)

Acquisition of C. difficile

Antibiotic therapy

Changes normal colonic bacteria

C diff over grows and produces toxin



## Diagnosis, Management, and Prevention of *Clostridium difficile* Infection in Long-Term Care Facilities: A Review

Andrew E. Simor, MD

- More than half of healthcare associated CDI cases occur in long-term care facilities
- A significant number of individuals admitted to LTC are colonized with C difficile
  - Up to 20% acquire it while in nursing homes
- CDI is the most commonly identified cause of acute diarrheal illness in the LTC population

# How does *C. diff* transmission occur in healthcare facilities?

## RESERVOIR

- ❑ Colonized individuals
- ❑ Environmental contamination

## SPREAD

- ❑ HCP hand contamination
- ❑ Shared equipment contamination

**Table I.** Microbiologic factors that can facilitate surface environment-mediated transmission of selected pathogens

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Pathogen able to survive for prolonged periods of time on environmental surfaces (all)
Ability to remain virulent after environmental exposure (all)
Contamination of the hospital environment frequent (all)
Ability to colonize patients ( <i>Acinetobacter</i> , <i>C difficile</i> , MRSA, VRE)
Ability to transiently colonize the hands of health care workers (all)
Transmission via the contaminated hands of healthcare workers (all)
Small inoculating dose ( <i>C difficile</i> , norovirus)
Relative resistance to disinfectants used on environmental surfaces ( <i>C difficile</i> , norovirus)

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*C difficile*, *Clostridium difficile*; MRSA, methicillin-resistant *Staphylococcus aureus*; VRE, vancomycin-resistant *Enterococcus* spp.

# Evaluate use of CDI diagnostics and communication of results

- ❑ What prompts stool testing for CDI in my facility?
- ❑ What test is used by the lab?
- ❑ How quickly are results communicated to providers?
- ❑ Do we have a protocol for implementing appropriate precautions on known or suspected CDI cases?

# C diff. prevention challenges

- Spores are not killed by alcohol hand rubs; the act rubbing your hands with soap under water removes the spores
- Spores are resistant to common cleaners and require bleach or a disinfectant with sporucidal activity to be effectively killed



# Environmental Cleaning

## Assess adequacy of cleaning before changing to new cleaning product such as bleach

- ❑ Ensure that environmental cleaning is adequate and high-touch surfaces are not being overlooked
- ❑ One study using a fluorescent environmental marker to assess cleaning showed:
  - Only 47% of high-touch surfaces in 3 hospitals were cleaned
  - Sustained improvement in cleaning of all objects, especially in previously poorly cleaned objects, following educational interventions with the environmental services staff
- ❑ The use of environmental markers is a promising method to improve cleaning.

# Steps to C. diff Infection (CDI)



Acquisition of C.  
difficile

Antibiotic therapy

Changes normal  
colonic bacteria

C diff over grows and  
produces toxin



# Antibiotics are misused in a variety of ways

- Given when they are not needed
- Continued when they are no longer necessary
- Given at the wrong dose
- Broad spectrum agents are used to treat very susceptible bacteria
- The wrong antibiotic is given to treat an infection

<http://www.cdc.gov/getsmart/healthcare/inpatient-stewardship.html#Facts>



# UTIs drive Antibiotic Use

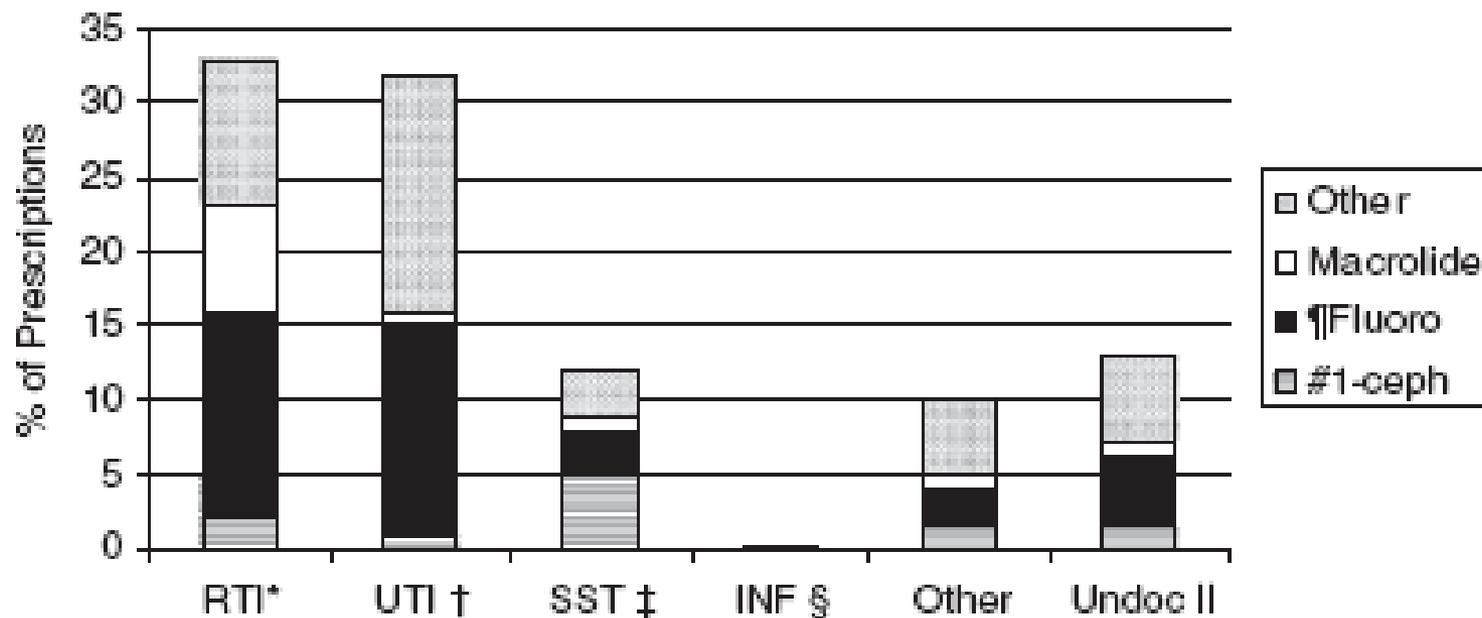


Figure 1. Indication for antimicrobials prescribed to nursing home residents stratified according to antimicrobial class, September 2001 to February 2002, Standing Orders Project

- 73 LTCF followed over 6 months:
- 42% of residents received antibiotic (3,392 prescriptions)

# Urinary Catheter Use

- 15-25% of hospitalized patients may receive a urinary catheter
  - 5% in long-stay population in LTCF
  - 10-12% in post-acute care population in LTCF
- Often placed/maintained for inappropriate indications
  - 28% of physicians unaware of catheter status
  - Documentation of indication/presence of catheter available for <50% of patients with device

Warren JW. *Int J Antimicrob Agents*. 2001;17:299-303 Weinstein JW, et al. *ICHE*. 1999;20:543-548  
Jain P, et al. *Arch Intern Med*. 1995;155:1425-1429 Saint S, et al. *Am J Med*. 2000;109:476-480  
Rogers MA, et al. *J Am Geriatr Soc*. 2008;56:854-861; Chenoweth C et al *Inf Dis Clin N Am* 2011: 103-115

# Catheter-associated UTI (CA-UTI)

- Indwelling urinary tract devices result in increased incidence of bacteriuria
  - 3-10% per catheter-day for Foley catheters
  - 26% of people with a catheter between 2-10 days
  - 100% of people with long-term (>30d) urinary tract devices have bacteriuria
- Urinary catheters are a leading risk factor for symptomatic UTI
- Catheter-associated UTI increases morbidity & mortality
- Driver of unnecessary antimicrobial use

# CA-UTI Guidelines

**Clinical Infectious Diseases** 2010;50:625–663

IDSA GUIDELINES

Diagnosis, Prevention, and Treatment of Catheter-Associated Urinary Tract Infection in Adults:  
2009 International Clinical Practice Guidelines  
from the Infectious Diseases Society of America

Thomas M. Hooton,<sup>1</sup> Suzanne F. Bradley,<sup>3</sup> Diana D. Cardenas,<sup>2</sup> Richard Colgan,<sup>4</sup> Suzanne E. Geerlings,<sup>7</sup>  
James C. Rice,<sup>5a</sup> Sanjay Saint,<sup>3</sup> Anthony J. Schaeffer,<sup>6</sup> Paul A. Tambayh,<sup>8</sup> Peter Tenke,<sup>9</sup> and Lindsay E. Nicolle<sup>10,11</sup>

# Diagnosing CA-UTI

3. Signs and symptoms compatible with CA-UTI include new onset or worsening of fever, rigors, altered mental status, malaise, or lethargy with no other identified cause; flank pain; costovertebral angle tenderness; acute hematuria; pelvic discomfort; and in those whose catheters have been removed, dysuria, urgent or frequent urination, or suprapubic pain or tenderness (A-III).

i. In patients with spinal cord injury, increased spasticity, autonomic dysreflexia, or sense of unease are also compatible with CA-UTI (A-III).

4. In the catheterized patient, pyuria is not diagnostic of CA-bacteriuria or CA-UTI (AII).

i. The presence, absence, or degree of pyuria should not be used to differentiate CA-ASB from CA-UTI (A-II).

ii. Pyuria accompanying CA-ASB should not be interpreted as an indication for antimicrobial treatment (A-II).

iii. The absence of pyuria in a symptomatic patient suggests a diagnosis other than CA-UTI (A-III).

5. In the catheterized patient, the presence or absence of odorous or cloudy urine alone should not be used to differentiate CA-ASB from CA-UTI or as an indication for urine culture or antimicrobial therapy (A-III).

# Managing CA-UTI

46. If an indwelling catheter has been in place for >2 weeks at the onset of CA-UTI and is still indicated, the catheter should be replaced to hasten resolution of symptoms and to reduce the risk of subsequent CA-bacteriuria and CA-UTI (A-I).

47. Seven days is the recommended duration of antimicrobial treatment for patients with CA-UTI who have prompt resolution of symptoms (A-III), and 10–14 days of treatment is recommended for those with a delayed response (A-III), regardless of whether the patient remains catheterized or not.

# CA-UTI Prevention

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HICPAC GUIDELINE

## Guideline for Prevention of Catheter-Associated Urinary Tract Infections 2009

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Practices Advisory Committee (HICPAC)

# Priority Recommendations

## 1. Appropriate Urinary Catheter Use

- Insert catheters only for appropriate indications , and leave in place only as long as needed. **(Category IA)**
  - Do not use urinary catheters in patients and nursing home residents for management of incontinence. **(Category IB)**
  - For operative patients who have an indication for an indwelling catheter, remove the catheter as soon as possible postoperatively, preferably within 24 hours, unless there are appropriate indications for continued use. **(Category IB)**

## 2. Aseptic Insertion of Urinary Catheters

- Ensure that only properly trained persons who know the correct technique of aseptic catheter insertion and maintenance are given this responsibility. **(Category IC)**
- Insert catheters using aseptic technique and sterile equipment. **(Category IC)**

## 3. Proper Urinary Catheter Maintenance

- Maintain a sterile, continuously closed drainage system **(Category IB)**

## Table 2. Appropriate Indications for Indwelling Urethral Catheter Use

Patient has acute urinary retention or obstruction

Need for accurate measurements of urinary output in critically ill patients

Perioperative use for selected surgical procedures:

- Patients undergoing urologic surgery or other surgery on contiguous structures of the genitourinary tract
- Anticipated prolonged duration of surgery (catheters inserted for this reason should be removed in PACU)
- Patients anticipated to receive large-volume infusions or diuretics during surgery
- Operative patients with urinary incontinence
- Need for intraoperative monitoring of urinary output

To assist in healing of open sacral or perineal wounds in incontinent patients

Patient requires prolonged immobilization (e.g., potentially unstable thoracic or lumbar spine)

To improve comfort for end of life care if needed

Indwelling catheters should *not* be used:

- As a substitute for nursing care of the patient or resident with incontinence
- As a means of obtaining urine for culture or other diagnostic tests when the patient can voluntarily void
- For prolonged postoperative duration without appropriate indications
- Routinely for patients receiving epidural anaesthesia

# Proper Techniques for Urinary Catheter Insertion

- A. Perform hand hygiene immediately before and after insertion or any manipulation of the catheter device or site.
- B. Ensure that only properly trained persons are performing insertion
- C. In the acute care hospital setting, insert urinary catheters using aseptic technique and sterile equipment.
- D. In the nonacute care setting, clean (ie, nonsterile) technique for intermittent catheterization is an acceptable and practical alternative to sterile technique for patients requiring chronic intermittent catheterization.
- E. Properly secure indwelling catheters after insertion to prevent movement and urethral traction.

# Proper Techniques for Urinary Catheter Maintenance

- A. Maintain a sterile, continuously closed drainage system
- B. Maintain unobstructed urine flow.
- C. Complex urinary drainage systems should not be used routinely to prevent CAUTI.
- D. Do not change indwelling catheters or drainage bags at arbitrary fixed intervals.
- E. Do not use systemic antimicrobials routinely to prevent CAUTI in patients requiring either short or long-term catheterization.
- F. Use Standard Precautions, including the use of gloves and gown as appropriate, during any manipulation of the catheter or collecting system

# “Bladder Bundle”

## The “ABCDE” for preventing CAUTI

Adherence to general infection control principles (eg, hand hygiene, surveillance and feedback, aseptic insertion, proper maintenance, education) is important.

Bladder ultrasound may avoid indwelling catheterization.

Condom catheters or other alternatives to an indwelling catheter such as intermittent catheterization should be considered in appropriate patients.

Do not use the indwelling catheter unless absolutely necessary.

Early removal of the catheter using a reminder or nurse-initiated removal protocol appears to be warranted.

*Data from Saint S, Olmsted RN, Fakhri MG, et al. Translating health care-associated urinary tract infection prevention research into practice via the bladder bundle. Jt Comm J Qual Patient Saf 2009;35(9):449–55.*

# Take Home Points

- ❑ MDROs move with patients between acute and LTC
  - ❑ Both settings contribute to emergence/spread
- ❑ Attention to infection prevention at the bedside and during care transitions can help address MDROs
- ❑ Focusing efforts on one or two key infections can impact MDRO prevention throughout your facility

# Thank you!!

**Email: [nstone@cdc.gov](mailto:nstone@cdc.gov) with  
questions/comments**



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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

**National Center for Emerging and Zoonotic Infectious Diseases  
Division of Healthcare Quality Promotion**

