

Prevention of Healthcare-Associated Infections Long-Term Care

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Preventing Infections in Non-Hospital Settings: Long-Term Care

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Long-Term Care Facility ≠ Acute Care Hospital

- Emphasis on home-like environment
- Residents with increasingly higher acuity levels
- Social activities (groups, common areas)
- Preserve functional status
- Limited research
- Constrained resources
- Diagnostic uncertainties
 - May not have labs on site nor access to specific tests
 - Residents with dementia may be difficult to assess

SHEA/APIC GUIDELINE

**SHEA/APIC Guideline: Infection Prevention and Control
in the Long-Term Care Facility**

July 2008

Philip W. Smith, MD; Gail Bennett, RN, MSN, CIC; Suzanne Bradley, MD, Paul Drinka, MD; Ebbing Lautenbach, MD;
James Marx, RN, MS, CIC; Lona Mody, MD; Lindsay Nicolle, MD; and Kurt Stevenson, MD

Long-Term Care Facilities

- 1.6 million – 3.8 million infections each year (one of most frequent cause for transfer to hospital)
 - Endemic such as urinary tract and respiratory infections
 - Outbreaks including influenza and norovirus
- Risk of healthcare-associated infections (HAIs) approaches acute care

Antibiotics in Nursing Homes

- Over 4 million Americans are admitted or reside in nursing homes/year
 - About 1.4 million reside in nursing homes (LTCF)
 - Over 3 million admitted for short stays each year
- Antibiotics most frequently prescribed med in nursing homes
- Up to 70% of residents receive 1 or more courses of antibiotics per year
- Roughly 40-75% of antibiotics are prescribed incorrectly.



Cost-estimates of antibiotics in nursing homes range from

\$38 million to
\$137 million
per year.¹

[CDC website](#)



In nursing homes with higher antibiotic use, **even residents who do not receive antibiotics are at increased risk** of indirect antibiotic-related harms due to the spread of resistant bacteria or *C. difficile* germs from other patients.²



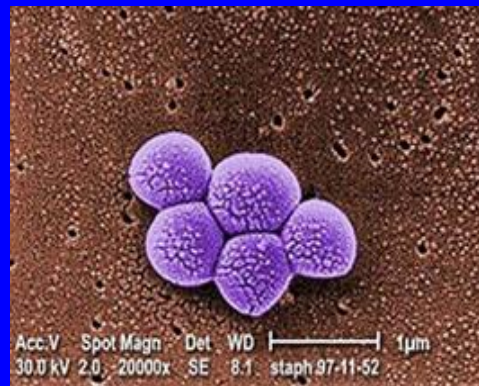
Residents in nursing homes with higher antibiotic use have a **24% increased risk** of antibiotic-related harm.²

Problems with Antibiotics

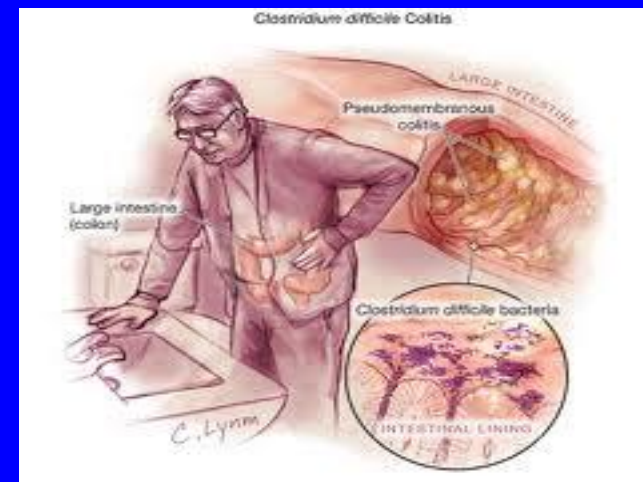


Adverse Drug Reactions

Multidrug Resistant Organisms



C Difficile Infection



ANTIBIOTIC RESISTANCE THREATS in the United States, 2013

Urgent Threats

- *Clostridium difficile*
- Carbapenem-resistant Enterobacteriaceae (CRE)
- Drug-resistant *Neisseria gonorrhoeae*

Serious Threats

- Multidrug-resistant *Acinetobacter*
- Drug-resistant *Campylobacter*
- Fluconazole-resistant *Candida* (a fungus)
- Extended spectrum β -lactamase producing Enterobacteriaceae (ESBLs)
- Vancomycin-resistant *Enterococcus* (VRE)
- Multidrug-resistant *Pseudomonas aeruginosa*
- Drug-resistant Non-typhoidal *Salmonella*
- Drug-resistant *Salmonella* Typhi
- Drug-resistant *Shigella*
- Methicillin-resistant *Staphylococcus aureus* (MRSA)
- Drug-resistant *Streptococcus pneumoniae*
- Drug-resistant tuberculosis

Concerning Threats

- Vancomycin-resistant *Staphylococcus aureus* (VRSA)
- Erythromycin-resistant Group A *Streptococcus*
- Clindamycin-resistant Group B *Streptococcus*

Growing complexity in the nursing home resident population

- ❑ Increasing post-acute care population
 - Growing medical complexity and care needs
 - Increasing exposure to devices, wounds and antibiotics
- ❑ Dynamic movement across healthcare settings
- ❑ High prevalence of multidrug-resistant organisms



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

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

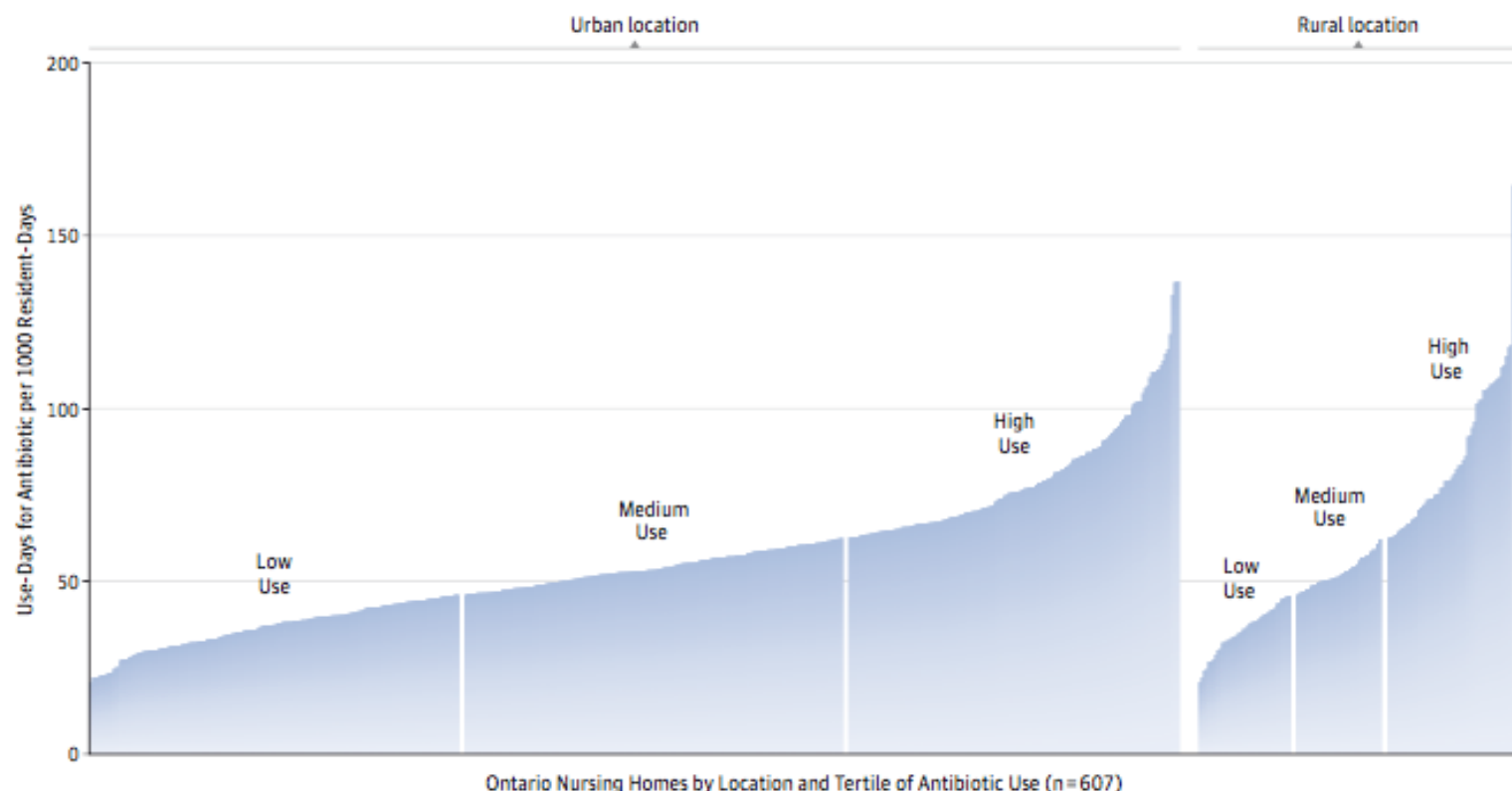
Antibiotic and dose	Treatment for:	Start date	Anticipated stop date

Vaccine	Date administered (If known)	Lot and Brand (If known)	Year administered (If exact date not known)	Does Patient self report receiving vaccine?	
Influenza (seasonal)				<input type="radio"/> yes	<input type="radio"/> no
Pneumococcal				<input type="radio"/> yes	<input type="radio"/> no
Other:				<input type="radio"/> yes	<input type="radio"/> no

Variability in Antibiotic Use Across Nursing Homes and the Risk of Antibiotic-Related Adverse Outcomes for Individual Residents

Nick Daneman, MD, MSc; Susan E. Bronskill, PhD; Andrea Gruneir, PhD; Alice M. Newman, MSc; Hadas D. Fischer, MD, MSc; Paula A. Rochon, MD, MPH; Geoffrey M. Anderson, MD, PhD; Chaim M. Bell, MD, PhD

Figure. Variability of Antibiotic Use (per 1000 Resident-days) Across Ontario Nursing Homes



The 607 Ontario nursing homes are presented by location (urban or rural) and tertile of antibiotic use (high, medium, or low).

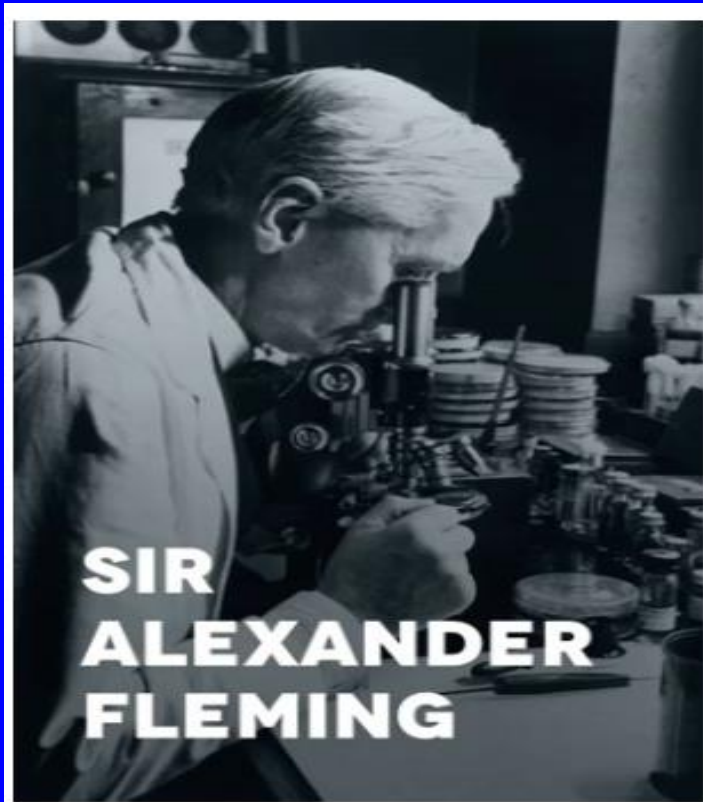
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- Antibiotic adverse events
 - *C difficile* infections or diarrhea
 - Multidrug resistant organisms
 - Allergies
 - Medication adverse events
- Adverse events (differences statistically significant - $p < .001$)
 - Higher use homes (13.3%)
 - Middle use (12.4%)
 - Low use (11.4%)

Learning From No-Fault Treatment Injury Claims to Improve the Safety of Older Patients

- In primary care in New Zealand the leading threat to safety in older patients was medication, in particular, antibiotics.
- *“To improve patients’ safety, we need to reduce potentially inappropriate medication use, especially for antibiotics, for which use not only poses a risk to individuals but also to society as a result of increasing antibiotic resistance.”*

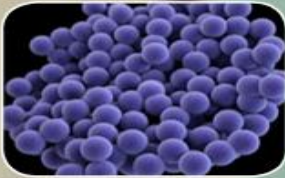
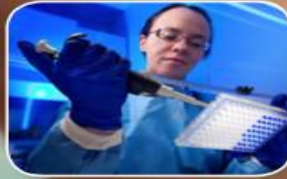


The British bacteriologist Alexander Fleming, urged caution; in a 1945 interview with *The New York Times*, Fleming *warned that misuse of penicillin could lead to the propagation of mutant forms of bacteria that would resist the new miracle drug.*

Effects of Excessive Antibiotic Use in Nursing Homes

Lona Mody, MD, MSc; Christopher Crnich, MD, PhD

Need a culture change that creates a sense of urgency among staff about prescribing



The Core Elements of
Antibiotic Stewardship
for Nursing Homes

Summary of Core Elements for Antibiotic Stewardship in Nursing Homes



Leadership commitment

Demonstrate support and commitment to safe and appropriate antibiotic use in your facility



Accountability

Identify physician, nursing and pharmacy leads responsible for promoting and overseeing antibiotic stewardship activities in your facility



Drug expertise

Establish access to consultant pharmacists or other individuals with experience or training in antibiotic stewardship for your facility



Action

Implement **at least one** policy or practice to improve antibiotic use



Tracking

Monitor **at least one process** measure of antibiotic use and **at least one outcome** from antibiotic use in your facility



Reporting

Provide regular feedback on antibiotic use and resistance to prescribing clinicians, nursing staff and other relevant staff



Education

Provide resources to clinicians, nursing staff, residents and families about antibiotic resistance and opportunities for improving antibiotic use

Antibiotic Stewardship

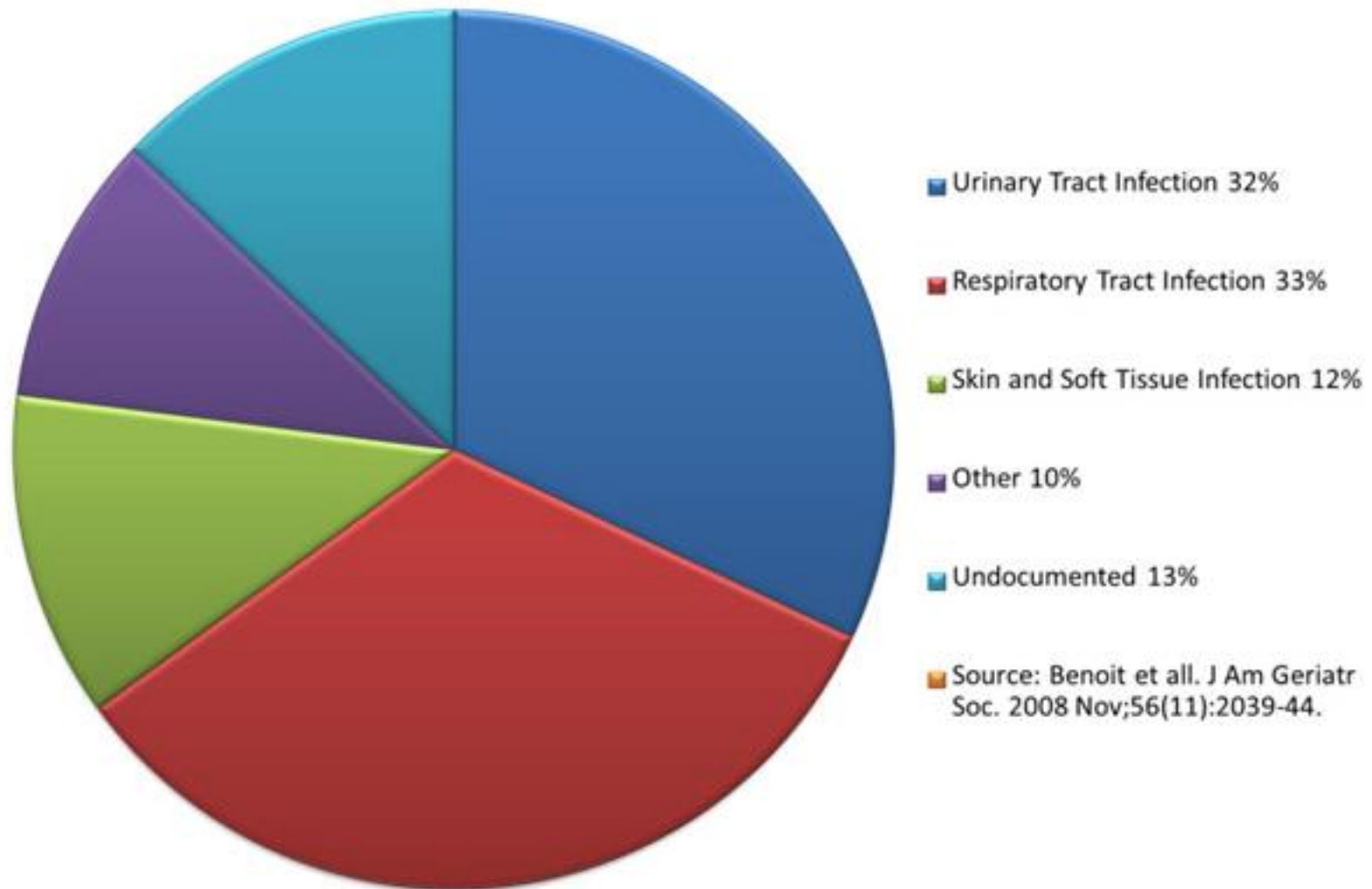
- Decreases antibiotic resistance, *C. difficile* infections, cost
 - Improves patient outcomes
 - First step in antibiotic stewardship is to promote antibiotic BEST PRACTICES
 - Support appropriate use of antibiotics
 - All antibiotics should include dose, duration, indication
 - Get cultures first
 - Take an ‘antibiotic timeout’ reassessing antibiotics after 48-72 hours.
- CDC website

RESEARCH

ANOTHER SETTING FOR STEWARDSHIP: HIGH RATE OF UNNECESSARY ANTIMICROBIAL USE IN A VETERANS AFFAIRS LONG-TERM CARE FACILITY

- Retrospective chart review – 6 months
- 100 antimicrobial regimens randomly selected
- 160 bed skilled nursing facility
- Results
 - Forty-two percent of antimicrobial regimens were entirely unnecessary.
 - Most common reasons
 - Treatment of asymptomatic bacteriuria or pyuria
 - Treatment of other noninfectious or non bacterial syndromes

Most common infections treated with antibiotics in nursing homes



New Push to Stop Overuse of Antibiotics in Nursing Homes

Up to 75% of prescriptions are incorrect as health officials open a new front in war on overuse

One of the biggest culprits, researchers say: misdiagnosed urinary tract infections. Only a quarter to a third of people in nursing homes who are diagnosed have actual symptoms, according to several studies. Most have only vague symptoms like confusion or bacteria in their urine that aren't actually causing an infection, says David Nace, director of long-term care and flu programs at the University of Pittsburgh. UTIs are "the poster child of inappropriate antibiotic use," he says.

THE WALL STREET JOURNAL.

Oct. 12, 2015

Inappropriate Treatment of Urinary Tract Infections Long Term Care

- Urinary tract infections
 - Common infection in LTC.
 - Common inappropriately treated infection in LTC .
- This is due to high prevalence of asymptomatic bacteriuria.

Prudent Use of Antibiotics in Long-Term Care Residents with Suspected UTIs



MASSPRO

Massachusetts Coalition
for the
Prevention of Medical Errors



Asymptomatic Bacteriuria (ASB)

- Laboratory diagnosis
- Positive urine culture
 - Colony count significant ($\geq 10^5$ cfu/mL)
- Absence of symptoms

Pyuria

- Pyuria (> 10 WBC / high-power field) is evidence of inflammation in the genitourinary tract
 - In persons with neutropenia significant bacteriuria may occur without pyuria
- Pyuria is commonly found with ASB
 - Elderly institutionalized residents 90% (Infect Dis Clin North Am 1997;11:647-62)
 - Short-term (< 30 days) catheters 30-75% (Arch IM 2000;160:673-82)
 - Long-term catheters 50-100% (Am J Infect Control 1985;13:154-60)

Treatment for ASB Not Indicated

- Premenopausal, non pregnant women
- Diabetic women
- ***Older persons living in the community***
- ***Elderly living in long term care facilities***
- Persons with spinal cord injury
- Catheterized patients

Treatment for ASB Indicated

- Pregnant women
 - Increased risk for adverse outcomes
- Urologic interventions
 - TURP
 - Any urologic procedure with potential mucosal bleeding

No Benefit Treating ASB in the Elderly

- Large long-term studies of ASB in pre and postmenopausal women
 - NO ADVERSE OUTCOMES if not treated
- Randomized studies (treatment vs. no treatment) in elderly LTC residents
 - NO BENEFIT to treatment
 - No decreased rate of symptoms
 - No improved survival

CID2005;40:643-654

Table 2. Prevalence of asymptomatic bacteriuria in selected populations.

Population	Prevalence, %	Reference
Healthy, premenopausal women	1.0–5.0	[31]
Pregnant women	1.9–9.5	[31]
Postmenopausal women aged 50–70 years	2.8–8.6	[31]
Diabetic patients		
Women	9.0–27	[32]
Men	0.7–11	[32]
Elderly persons in the community ^a		
Women	10.8–16	[31]
Men	3.6–19	[31]
Elderly persons in a long-term care facility		
Women	25–50	[27]
Men	15–40	[27]
Patients with spinal cord injuries		
Intermittent catheter use	23–89	[33]
Sphincterotomy and condom catheter in place	57	[34]
Patients undergoing hemodialysis	28	[28]
Patients with indwelling catheter use		
Short-term	9–23	[35]
Long-term	100	[22]

^a Age, ≥ 70 years.

Change in Mental Status: Delirium(s)

D Drugs	BEERS Criteria (e.g., anticholinergic, benzodiazepines, hypnotics) OR dose change
Dementia	Dementia Lewy bodies: Fluctuations in alertness and attention
Discomfort	Pain, insomnia, depression
E Eyes, ears, environment	Sensory deprivation; vulnerability to environment
L Low oxygen states	Myocardial infarction, stroke, pulmonary embolus
I Infection	Pneumonia, sepsis, symptomatic UTI, cellulitis
R Retention	Urinary retention, constipation
I Ictal states	Seizure disorder
U Underhydration/nutrition	Dehydration
M Metabolic Causes	Low or high blood sugar, sodium abnormalities
S Subdural hematoma	Head trauma

IDSA Recommendations

- Routine screening for and treatment of ASB in older individuals in the community is not recommended.
- Screening for and treatment of ASB in elderly residents in LTCFs is not recommended.

CID2005;40:643-654

Infectious Diseases Society of America Guidelines for the Diagnosis and Treatment of Asymptomatic Bacteriuria in Adults

Lindsay E. Nicolle,¹ Suzanne Bradley,² Richard Colgan,³ James C. Rice,⁴ Anthony Schaeffer,⁵ and Thomas M. Hooton⁶

¹University of Manitoba, Winnipeg, Canada; ²University of Michigan, Ann Arbor; ³University of Maryland, Baltimore; ⁴University of Texas, Galveston; ⁵Northwestern University, Chicago, Illinois; and ⁶University of Washington, Seattle

SUMMARY OF RECOMMENDATIONS

1. The diagnosis of asymptomatic bacteriuria should be based on results of culture of a urine specimen collected in a manner that minimizes contamination (A-II) (table 1).

- For asymptomatic women, bacteriuria is defined as 2 consecutive voided urine specimens with isolation of the same bacterial strain in quantitative counts $\geq 10^5$ cfu/mL (B-II).
- A single, clean-catch voided urine specimen with 1 bacterial species isolated in a quantitative count $\geq 10^5$ cfu/mL identifies bacteriuria in men (B-III).
- A single catheterized urine specimen with 1 bacterial species isolated in a quantitative count $\geq 10^2$ cfu/mL identifies bacteriuria in women or men (A-II).

2. Pyuria accompanying asymptomatic bacteriuria is not an indication for antimicrobial treatment (A-II).

3. Pregnant women should be screened for bacteriuria by urine culture at least once in early pregnancy, and they should be treated if the results are positive (A-I).

- The duration of antimicrobial therapy should be

3–7 days (A-II).

- Periodic screening for recurrent bacteriuria should be undertaken following therapy (A-III).
- No recommendation can be made for or against repeated screening of culture-negative women in later pregnancy.

4. Screening for and treatment of asymptomatic bacteriuria before transurethral resection of the prostate is recommended (A-I).

- An assessment for the presence of bacteriuria should be obtained, so that results will be available to direct antimicrobial therapy prior to the procedure (A-III).
- Antimicrobial therapy should be initiated shortly before the procedure (A-II).
- Antimicrobial therapy should not be continued after the procedure, unless an indwelling catheter remains in place (B-II).

5. Screening for and treatment of asymptomatic bacteriuria is recommended before other urologic procedures for which mucosal bleeding is anticipated (A-III).

6. Screening for or treatment of asymptomatic bacteriuria is not recommended for the following persons.

- Premenopausal, nonpregnant women (A-I).
- Diabetic women (A-I).
- Older persons living in the community (A-II).
- Elderly, institutionalized subjects (A-I).
- Persons with spinal cord injury (A-II).
- Catheterized patients while the catheter remains in situ (A-I).

7. Antimicrobial treatment of asymptomatic women with catheter-acquired bacteriuria that persists 48 h after indwelling catheter removal may be considered (B-I).

Received 29 October 2004; accepted 2 November 2004; electronically published 4 February 2005.

These guidelines were developed and issued on behalf of the Infectious Diseases Society of America and have been endorsed by the American Society of Nephrology and the American Geriatric Society.

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Clinical Infectious Diseases 2005;40:643–654

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An initiative of the ABIM Foundation

American Geriatrics Society



Leading Change. Improving Care for Older Adults.

Five Things Physicians and Patients Should Question

5

Don't use antimicrobials to treat bacteriuria in older adults unless specific urinary tract symptoms are present.

Cohort studies have found no adverse outcomes for older men or women associated with asymptomatic bacteriuria. Antimicrobial treatment studies for asymptomatic bacteriuria in older adults demonstrate no benefits and show increased adverse antimicrobial effects. Consensus criteria has been developed to characterize the specific clinical symptoms that, when associated with bacteriuria, define urinary tract infection. Screening for and treatment of asymptomatic bacteriuria is recommended before urologic procedures for which mucosal bleeding is anticipated.



An initiative of the ABIM Foundation

AMDA – Dedicated to Long Term Care Medicine™



Dedicated To Long Term Care Medicine

Five Things Physicians and Patients Should Question

Don't obtain a urine culture unless there are clear signs and symptoms that localize to the urinary tract.

3

Chronic asymptomatic bacteriuria is frequent in the LTC setting, with prevalence as high as 50%. A positive urine culture in the absence of localized urinary tract infection (UTI) symptoms (i.e., dysuria, frequency, urgency) is of limited value in identifying whether a patient's symptoms are caused by a UTI. Colonization (a positive bacterial culture without signs or symptoms of a localized UTI) is a common problem in LTC facilities that contributes to the over-use of antibiotic therapy in this setting, leading to an increased risk of diarrhea, resistant organisms and infection due to *Clostridium difficile*. An additional concern is that the finding of asymptomatic bacteriuria may lead to an erroneous assumption that a UTI is the cause of an acute change of status, hence failing to detect or delaying the more timely detection of the patient's more serious underlying problem. A patient with advanced dementia may be unable to report urinary symptoms. In this situation, it is reasonable to obtain a urine culture if there are signs of systemic infection such as fever (increase in temperature of equal to or greater than 2°F [1.1°C] from baseline) leukocytosis, or a left shift or chills in the absence of additional symptoms (e.g., new cough) to suggest an alternative source of infection.

Preventing Unnecessary Use of Antibiotics

- **ASSESSMENT** protocols
 - Bacterial infection less likely if resident afebrile, CBC normal, no signs/symptoms of focal infection
- **SPECIFIC CRITERIA** for initiating antibiotics
- **OBSERVATION** as a **STANDARD MEDICAL PROCEDURE**
 - Monitoring protocols

• JAMDA 2010;11:537-539

When Antibiotics are Not Prescribed (Monitoring Protocol)

- Monitor vital signs for several days
- Monitor for progression of symptoms or change in clinical status
- Encourage fluid intake
- Consider alternate diagnosis for nonspecific symptoms
- If symptoms resolve, no further intervention required

• Annals of LTC April 2012;20:23-29

ABCs for Diagnosing Urinary Tract Infection in Long Term Care

Resident Name: _____ Date/Time: _____

Nurse: _____ MD/NP/PA: _____

Diagnosis of Urinary Tract Infection (UTI) in long term care resident requires clinical signs and symptoms of UTI and a positive culture.

Assessment: Clinical Signs and Symptoms of UTI¹

CHECK HERE IF CRITERIA ARE MET FOR SIGNS OR SYMPTOMS

Resident without indwelling catheter*

- Acute dysuria alone OR
- Fever + at least one of the symptoms below (new or increased) OR
- If no fever, at least two of the symptoms below (new or increased)
 - Urgency
 - Frequency
 - Suprapubic pain
 - Gross hematuria
 - Costovertebral angle (CVA) pain or tenderness
 - Urinary incontinence

*Mental status changes alone are not specific enough to identify symptomatic urinary tract infection. See reverse side for alternative causes.

OR

Resident with indwelling catheter

- At least one of the symptoms below (new or increased)
 - Fever
 - Costovertebral angle (CVA) pain or tenderness
 - Rigors (shaking chills)
 - Delirium
 - Flank pain (back, side pain)
 - Pelvic discomfort
 - Acute hematuria
 - Malaise or lethargy with no other cause

Blood Pressure _____ Pulse _____ Temperature _____ Respiratory Rate _____

Fever (oral > 100°F or any site > 2°F above baseline or repeated oral > 99°F / rectal > 99.5°F)

Bacteria (Order urinalysis and culture & sensitivity if above criteria are met)

Collect clean voided specimen if possible; in and out catheter if necessary. For residents with chronic indwelling Foley catheter, change catheter; send urine obtained from new catheter.

Consider CBC, BMP if clinically indicated (e.g., lethargy, fever). The presence of an elevated WBC count suggests infection, with or without a fever.

Urinalysis		Culture and sensitivity	
Nitrite	<input type="checkbox"/> Positive <input type="checkbox"/> Negative	<input type="checkbox"/> Positive urine culture:	
Leukocyte esterase	<input type="checkbox"/> Positive <input type="checkbox"/> Negative	Clean catch specimen:	≥ 10 ⁵ cfu/mL with ≤ 2 organisms
Pyuria	<input type="checkbox"/> > 10 WBC urinalysis	Catheterized specimen (straight cath or newly placed indwelling cath):	≥ 10 ² cfu/mL with ≥ 1 organism
		<input type="checkbox"/> Negative urine culture	

Massachusetts Coalition
for the
Prevention of Medical Errors

Massachusetts
Partnership
Collaborative:
Improving
Antibiotic
Stewardship for
UTI

Care Plan

Criteria met for UTI symptoms AND positive urine culture



- Review for treatment with antibiotics
- Monitor vital signs
- Monitor fluid intake and increase if indicated

Criteria not met for UTI symptoms (with or without a positive urine culture)



- Review for alternate diagnosis
- Monitor vital signs and symptoms
- Monitor fluid intake and increase if indicated
- Re-evaluate if above criteria for symptomatic UTI emerge

AT ANY POINT, re-evaluate and review with MD/NP/PA, if symptoms progress or if the resident has any of the following: Fever > 100.5° F, heart rate > 100 or < 50, RR > 28/min or < 10/min, BP < 90 or > 200 systolic, oxygen saturation < 90%, finger stick glucose < 70 or > 300, unable to eat or drink.

Prior to treatment consider review:

Advance directives for limiting treatment (especially antibiotics):	<input type="checkbox"/> NO	<input type="checkbox"/> YES
Medication Allergies:	<input type="checkbox"/> NO	<input type="checkbox"/> YES
The resident is on warfarin (Coumadin)	<input type="checkbox"/> NO	<input type="checkbox"/> YES

Possible causes for mental status changes include:

- Constipation
- Pain
- Dehydration
- Medication or dose change
- Hypoxia
- Infections such as pneumonia
- Hypo/hyperglycemia
- Urinary retention
- Environmental triggers

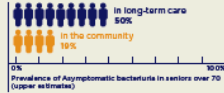
NOTES

Clinician Education Sheet

Mass. Infection Prevention Partnership
Prepared for Massachusetts long term care facilities

Treating Asymptomatic Bacteriuria: All harm, No Benefit

High Prevalence of Asymptomatic Bacteriuria
 > The bladder is normally colonized in many elderly people
 > A positive urinalysis or culture in the absence of symptoms reveals colonization, not infection
 > Treatment of asymptomatic bacteriuria is not recommended



It's Hard to Ignore A Positive Test
 Habitual Testing + Prevalent Colonization = Unnecessary prescriptions & missing the real diagnosis



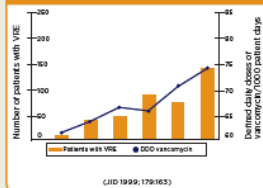
Unnecessary Rx and Missed Diagnoses Harm Patients
 > Drug-drug interactions > *C. difficile* infection
 > Renal & other complications > Nausea and vomiting
 > Increase of multi-drug resistant bacteria > Missing the real diagnosis



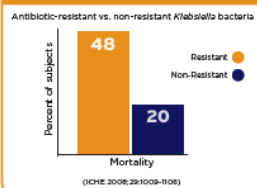
Myth	Fact
Positive urine culture and abnormal urinalysis (positive nitrites or leukocytes, increased white blood cells or pyuria) always indicates a urinary tract infection and requires antibiotics.	Positive urine culture and abnormal urinalysis in a resident without symptoms is consistent with asymptomatic bacteriuria – that is, colonization – not infection. Treatment with antibiotics is not indicated.
Positive urine culture in resident with chronic indwelling catheter always indicates a urinary tract infection and requires antibiotics.	A chronic indwelling catheter is associated with bacteriuria 300% of the time. There is no need to treat unless the resident has symptoms of a UTI.
Elderly residents often have a urinary tract infection with no symptoms except a change in mental status or delirium.	A change in mental status or delirium is a non-specific symptom and may accompany a change in condition such as dehydration, constipation, adverse drug effect, pneumonia, urinary retention, metabolic problems, head trauma, environmental changes, or sensory deprivation.
In an elderly population, urinary tract infections often present with nonspecific symptoms (e.g., falls, functional decline).	Mental status change requires an exploration of alternative causes and may not require antibiotics for UTI unless there are more specific signs or symptoms that point to that diagnosis.
Cloudy or malodorous urine is always diagnostic of a urinary tract infection.	Nonspecific symptoms can be seen in many conditions such as dehydration or adverse drug effect. Diagnosing and treating UTI based on these nonlocalizing symptoms not only results in inappropriate antibiotic use, it also completely misses the real diagnosis.
	These changes may be seen in asymptomatic bacteriuria. Other causes can include dehydration, certain medications and diet.

Dangers of Unnecessary Antibiotics

Using Antibiotics Breeds Resistance in Your Patients and the Community



Infection with Resistant Bacteria Increases Risk of Death



Do Not Test, Do Not Treat Asymptomatic Bacteriuria!

Criteria for Urine Testing

Resident without indwelling catheter

- Acute dysuria alone OR
- Fever + at least one of the symptoms below (new or increased) OR
- If no fever, at least two of the symptoms below (new or increased)
 - Gross hematuria
 - Urinary incontinence
 - Urgency
 - Suprapubic pain
 - Costovertebral angle tenderness
 - Frequency

Resident with indwelling catheter

- At least one of the symptoms below (new or increased)
 - Fever
 - Pelvic discomfort
 - Flank pain (back, side pain)
 - Malaise or lethargy no other cause
 - Costovertebral angle (CVA) tenderness
 - Rigors (shaking chills)
 - Delirium
 - Acute hematuria



No symptoms of UTI
 > Do not test urine
 > Do not treat if a urine test was done by someone else or for "routine"

Weakness, delirium, or fever without a focus
 > Individualize care
 > Be mindful of the presence of asymptomatic bacteriuria
 > Seek other causes

Specific UTI symptoms
 > Test or treat as usual

Challenges

The resident's family wants a urine test and antibiotic treatment in the setting of asymptomatic bacteriuria.

We've always ordered urine cultures for nonspecific problems in residents with dementia.

It is okay to give an antibiotic even if it may not be needed. Better safe than sorry.

It is hard to ignore a positive urine test even when done for no clearly apparent reason.

Strategies for practice change

Educate the family about the prevalence of asymptomatic bacteriuria, and tell them you do not suspect UTI on clinical grounds.
 Emphasize the dangers of antibiotic overuse.

There are many potential causes for nonspecific changes in status and thorough evaluation is needed.
 Residents in long-term care frequently have positive urine cultures, even when they are well.

Antibiotics can cause adverse drug reactions, *C. difficile* infection, and promote the emergence of multi-drug resistant organisms. They should not be administered unless clinically indicated.

Treatment decisions should not be made based on test results alone.
 Evaluate the resident clinically and consider a period of observation.

Reference: 1. ID 2015;23:1025-1028; 2. ID 2006;48:146-151; 3. ID 2001;20:120-124; 4. ID 2005;46:149-54

Massachusetts Infection Prevention Partnership
 Massachusetts Coalition for the Prevention of Medical Errors, Massachusetts Department of Public Health, Massachusetts Senior Care Association, MassSPIC
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 Daniel Pallen MD, MPH, Director of Research Brigham & Women's Hospital Department of Emergency Medicine, and Chairman, Brigham and Women's Hospital Clinical Investigation Committee
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Resident/Family Brochure

Adapted by the
Massachusetts Infection Prevention Partnership*



Massachusetts Coalition
for the
Prevention of Medical Errors



When Do You Need An Antibiotic?

Taking antibiotics when you don't need them is like leaving the lights on all the time.

- » The lights may burn out, leaving you in the dark when you most need them.
- » If you use antibiotics when you don't need them, they may not work when you get sick.



Read more inside...

Antibiotics: Powerful Drugs, But Only When Used For The Right Reasons.

Antibiotic drugs are strong medicine that can save lives when used appropriately to treat bacterial infections. Overuse of antibiotics can cause problems for individuals and for the health of the community. It is important for us all that these powerful drugs are used only when they can help, so they will work when we really need them.

Overusing Antibiotics Can Cause Problems.

How can antibiotics hurt you?

Antibiotic drugs can save lives but using antibiotics can cause problems too. Older people have more side effects from medicines, which can cause problems all over the body.

Antibiotics can:

- > Cause nausea and vomiting.
- > Cause diarrhea, including the kind due to *C. difficile* that can lead to severe symptoms.
- > Cause rash or other allergic reactions.
- > Harm your kidneys.
- > Create bacteria that are resistant to antibiotics.

What Is "antibiotic resistance"?

Antibiotics normally work by killing germs called bacteria. Sometimes not all of the germs are killed. The strongest ones are left to grow and spread. A person can get sick again, and this time the germs are harder to kill because the antibiotics no longer work. This is called resistance and makes some infections very hard to control.

Resistance can make you sick longer, and need more doctor visits and drugs that are even stronger. The more often you use an antibiotic, the greater the chance that the germs will become resistant.

Preliminary Data

Results: Cdiff, UTI, urine culture rates

Measure, IRR (95% CI)	1st Collaborative Experience (n=17)	Continuing Facility 2nd Collaborative Experience (n=12)	New Facility 2 nd Collaborative Experience (n=13)
<i>C. difficile</i> IRR	0.55 (0.39 - 0.78)	0.85 (0.45 - 1.68)	0.64 (0.33 - 1.28)
Urinary Tract Infection IRR	0.67 (0.59 - 0.76)	0.42 (0.35 - 0.50)	0.66 (0.56 - 0.77)
Urine Culture Rate IRR	0.73 (0.66 - 0.79)	0.47 (0.42 - 0.52)	0.68 (0.62 - 0.75)



Background: Impact of CAUTI

- Most common type of healthcare-associated infection
 - > 30% of HAIs reported to NHSN
 - Estimated > 560,000 nosocomial UTIs annually
- Increased morbidity & mortality
 - Estimated 13,000 attributable deaths annually
 - Leading cause of secondary BSI with ~10% mortality
- Excess length of stay –2-4 days
- Increased cost – \$0.4-0.5 billion per year nationally
- Unnecessary antimicrobial use

Hidron AI et al. ICHE 2008;29:996-1011

Klevens RM et al. Pub Health Rep 2007;122:160-6

Weinstein MP et al. Clin Infect Dis 1997;24:584-602

Cope M et al. Clin Infect Dis 2009;48:1182-8

Givens CD, Wenzel RP. J Urol 1980;124:646-8

Green MS et al. J Infect Dis 1982;145:667-72

Foxman B. Am J Med 2002;113:5S-13S

Saint S. Am J Infect Control 2000;28:68-75



Background: Urinary Catheter Use

- 15-25% of hospitalized patients
- 5-10% (75,000-150,000) NH residents
- Often placed for inappropriate indications
- Physicians frequently unaware
- In a recent survey of U.S. hospitals:
 - > 50% did not monitor which patients catheterized
 - 75% did not monitor duration and/or discontinuation

Weinstein JW et al. ICHE 1999;20:543-8

Warren JW et al. Arch Intern Med 1989;149:1535-7

Benoit SR et al. J Am Geriatr Soc 2008;56:2039-44

Rogers MA et al J Am Geriatr Soc 2008;56:854-61

Munasinghe RL et al. ICHE 2001;22:647-9

Saint S et al. Am J Med 2000;109:476-80

Jain P et al. Arch Intern Med 1995;155:1425-9

Saint S. et al. Clin Infect Dis 2008;46:243-50

Enhancing Resident Safety by Preventing Healthcare-Associated Infection: A National Initiative to Reduce Catheter-Associated Urinary Tract Infections in Nursing Homes

Lona Mody,^{1,2} Jennifer Meddings,^{3,4} Barbara S. Edson,⁵ Sara E. McNamara,² Barbara W. Trautner,^{6,7} Nimalie D. Stone,⁸ Sarah L. Krein,^{3,9} and Sanjay Saint^{3,9,10}

Table 1. C.A.U.T.I Clinical Component^a

- | | |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| C | C atheter free, catheters in any resident should be assessed for necessity; remove the catheter if there is no appropriate indication for use; every resident deserves a chance to be “catheter free” and “infection free”. |
| A | A septic insertion of indwelling catheters, with hand hygiene before and after every resident contact, and barrier precautions (gloves and gowns) during assistance with activities of daily living (ADLs) [21]. |
| U | U se of catheters only if indicated; routine assessment of catheter need (daily in short-stay residents, monthly in long-stay residents) should be conducted and alternatives should be considered (such as intermittent catheterization, use of bladder scanner protocols to decrease need for catheterization, and other noncatheter solutions to incontinence). |
| T | T rainning and mentorship of staff and family regarding catheter care is important, emphasizing the following points: keep the drainage bag below the bladder, no violations of a “closed” drainage system and appropriate use and care of leg bags, and managing “kinks” in tubing. |
| I | I ncontinence care planning to address individual resident challenges and solutions are important, including behavioral interventions such as timed and prompted voiding and appropriate medical management. |

Catheter Alert!

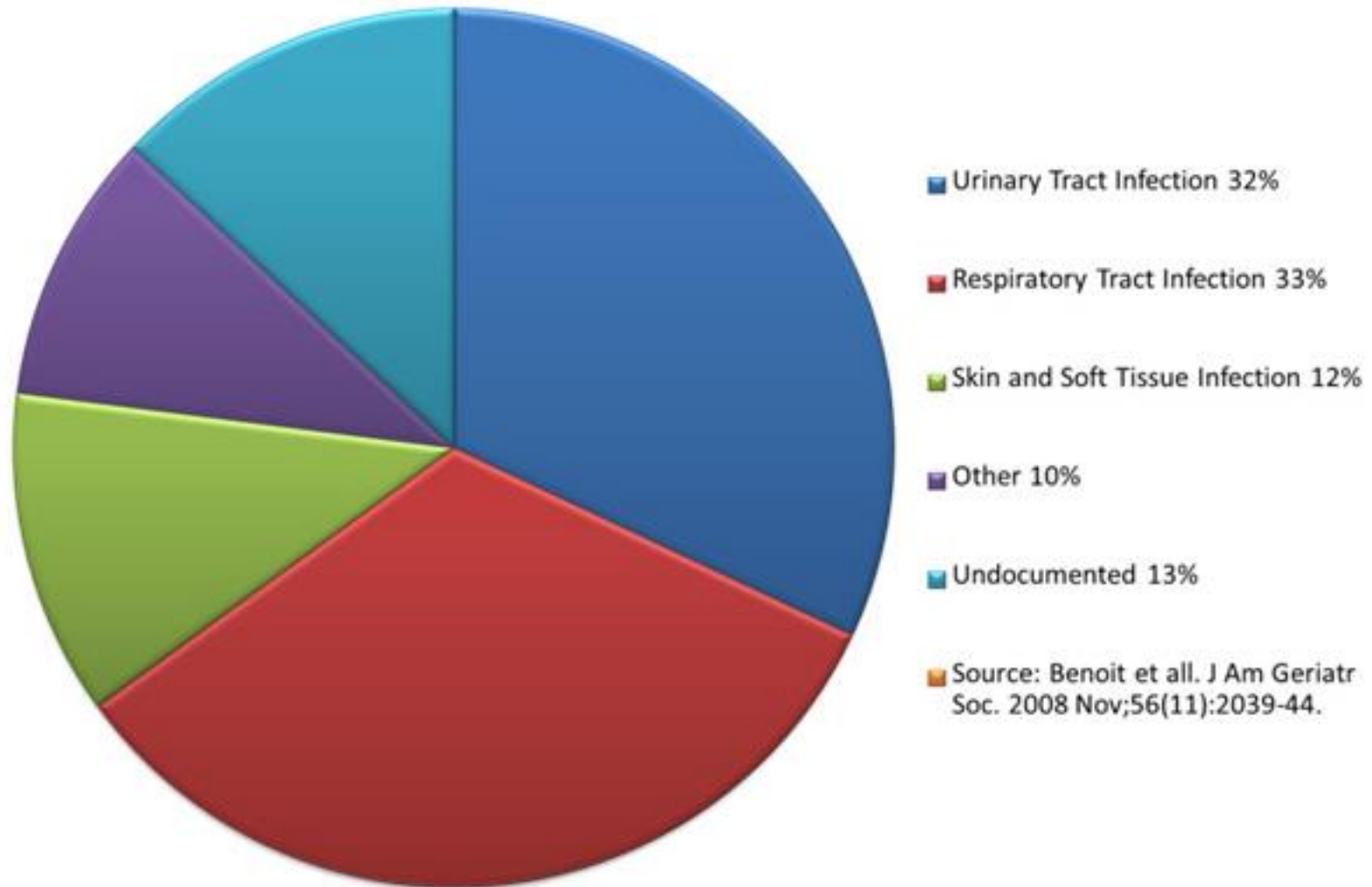
Indication for catheter: _____

Expected duration: _____

Physician Signature: _____

Date: _____

Most common infections treated with antibiotics in nursing homes



Not All Respiratory Infections Require Antibiotics

- Upper respiratory infections
- Bronchitis without COPD
- Influenza without secondary infection

• Annals Long Term Care 2012;20(4)

CDC: Many Flu Patients Still Getting Antibiotics at Outpatient Clinics

— Researchers call for better education on what works and what doesn't

Presentation IDWeek 2015 meeting

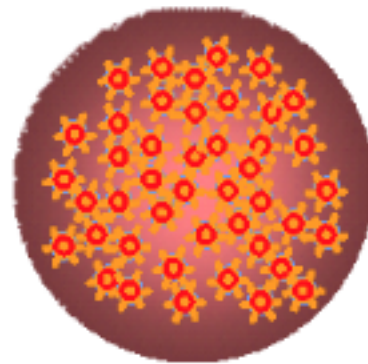
- 14,487 patients with flu symptoms in outpatient clinics during 2 flu seasons
 - 42% given antibiotics
 - 56% broad spectrum antibiotics
 - 1/3 of the broad spectrum antibiotics given to patients 50 and older
- Recommendation for delayed scripts

Delayed antibiotic prescribing strategies for respiratory tract infections in primary care: pragmatic, factorial, randomised controlled trial

- *Little difference in symptom control between strategies involving no prescription, immediate prescription, or delayed prescription.*
- Delayed prescriptions is likely to be associated *with fewer than 40%* of patients using antibiotics.
- Complications occurred in about 2-3% of patients given no antibiotic prescription compared with 1% of the delayed groups.



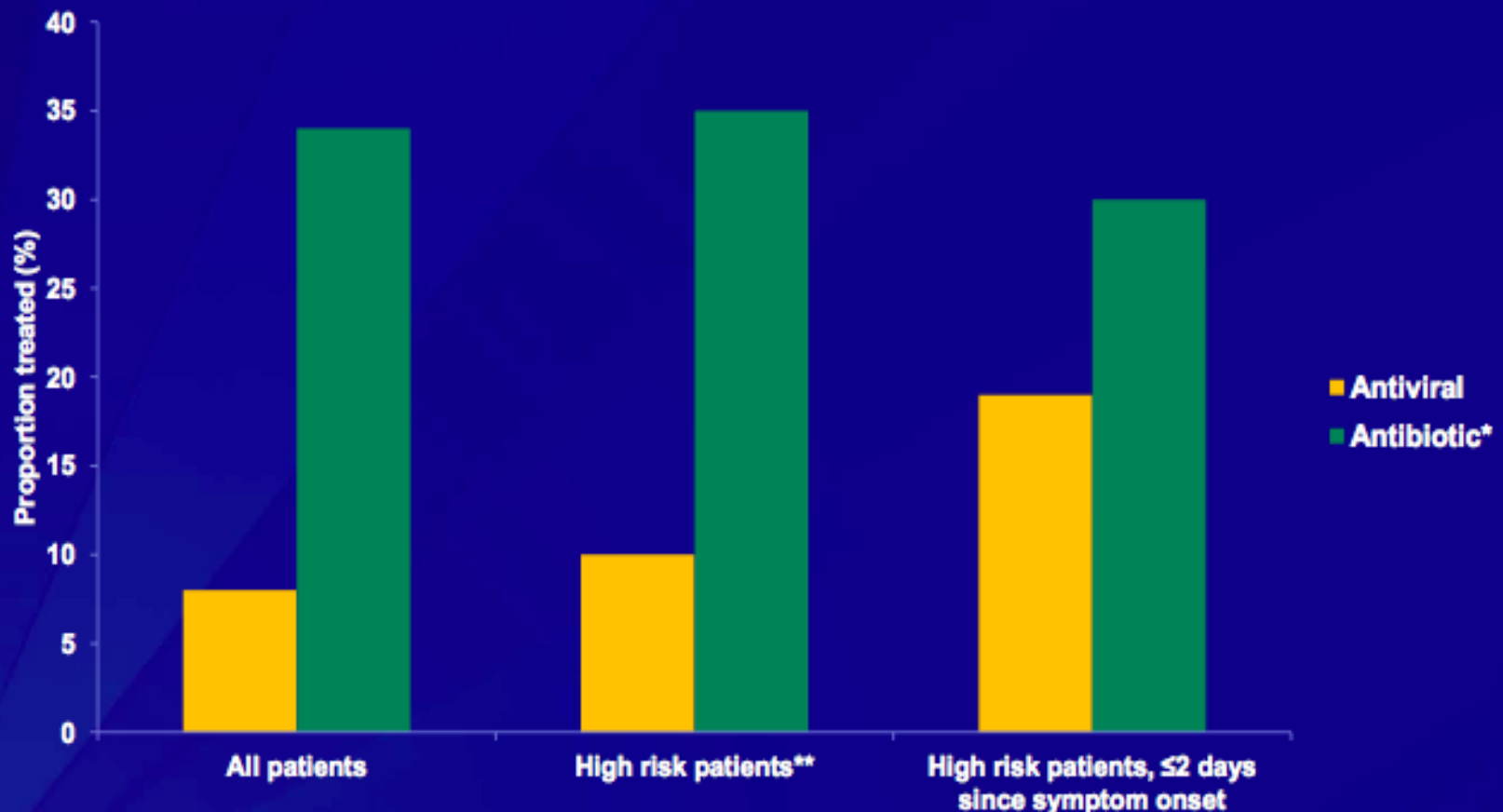
Antibiotics



Virus

Antibiotics have NO EFFECT on viruses!

Outpatients with Acute Respiratory Illness Treated with an Influenza Antiviral Medication or Antibiotics During Influenza Season, US Flu VE Network, 2012-13



* Antibiotics limited to amoxicillin, amoxicillin-clavulanate, and azithromycin

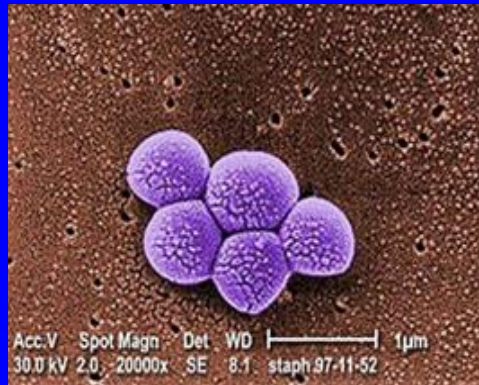
Data from Havers, et al. CID 2014;59(6):774-82

Problems with Antibiotics

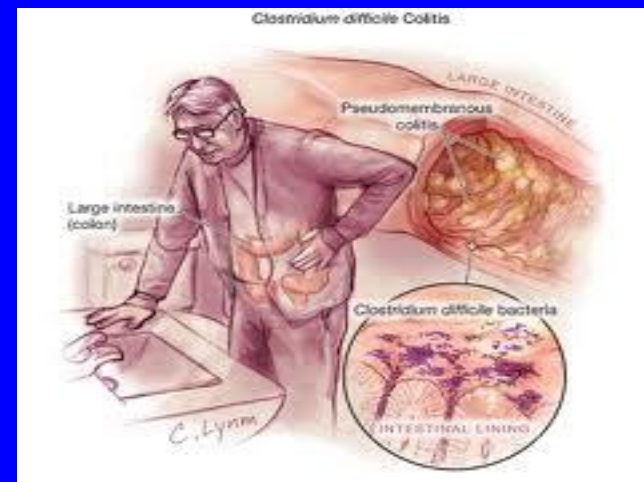


Adverse Drug Reactions

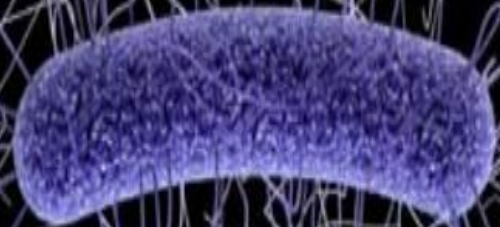
Multidrug Resistant Organisms



C. Difficile Infection



CLOSTRIDIUM DIFFICILE



THREAT LEVEL
URGENT



This bacteria is an immediate public health threat that requires urgent and aggressive action.



250,000

INFECTIONS PER YEAR



14,000

DEATHS



\$1,000,000,000

IN EXCESS MEDICAL COSTS PER YEAR



Background: Epidemiology

Risk Factors

- Antimicrobial exposure
- Acquisition of *C. difficile*
- Advanced age
- Underlying illness
- Immunosuppression
- Tube feeds
- Gastric acid suppression

Main modifiable risk factors

FDA Drug Safety Communication: Clostridium difficile infection can be associated with stomach acid drugs known as proton pump inhibitors (PPIs) February 2012

Vital Signs: Preventing *Clostridium difficile* Infections

- CDI increased past decade and more serious
- 94% related to health-care exposures are potentially preventable by
 - Reducing antibiotic use
 - Interrupting patient to patient transmission.
- CDIs were reduced by 20% over 21 months in 71 hospitals participating in infection control prevention.

My Mother-in-Law

- Admitted to rehab facility s/p surgery
- Foley placed for unclear reasons
- Foley removed after multiple requests but UA and C&S sent for unclear reasons
- Antibiotics initiated for positive urine culture
- Antibiotics stopped after multiple requests
- *C difficile* infection soon followed

Clostridium difficile Infection in Long-term Care Facilities: A Call to Action for Antimicrobial Stewardship

- Empowering midlevel providers to order *C. difficile* tests based on clinical presentation
- Bundle approach with combination infection control and antimicrobial management
- Contact (plus) precautions
- Treatment antibiotics
- Hand hygiene soap and water
- Effective terminal cleaning (1:1 hypochlorite solution or 10% bleach)
- Antibiotic stewardship



Hand hygiene is the single most effective way to decrease transmission of infections.

Ignaz Semmelweis, 1815-1865



Semmelweis

1840' s: General Hospital of Vienna

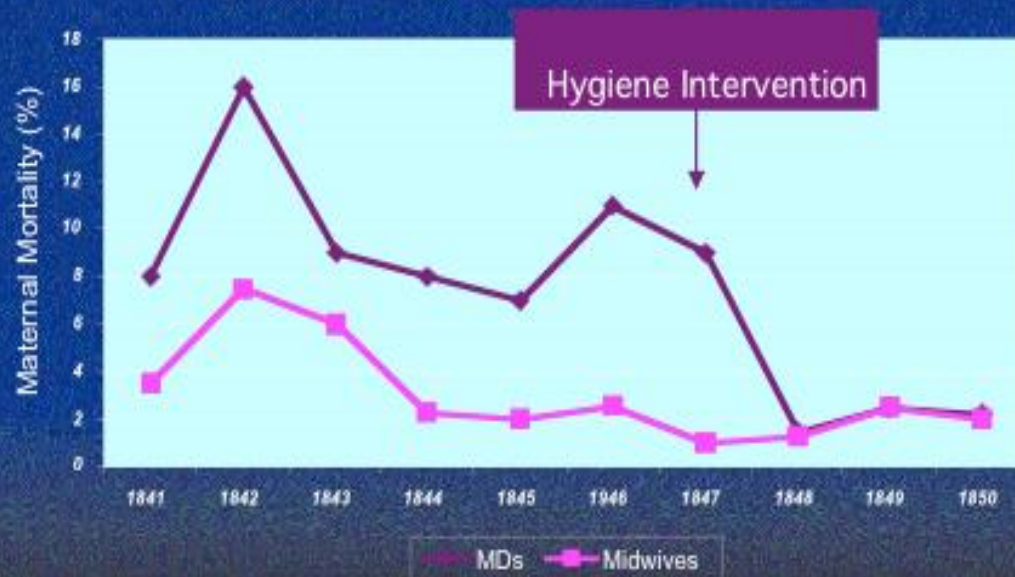
- Divided into two divisions, alternating admissions every 24 hours:
 - First Division: Doctors and medical students
 - Second Division: Midwives and their students

The Intervention: Hand scrub with chlorinated lime solution



Hand Hygiene: Not a New Concept

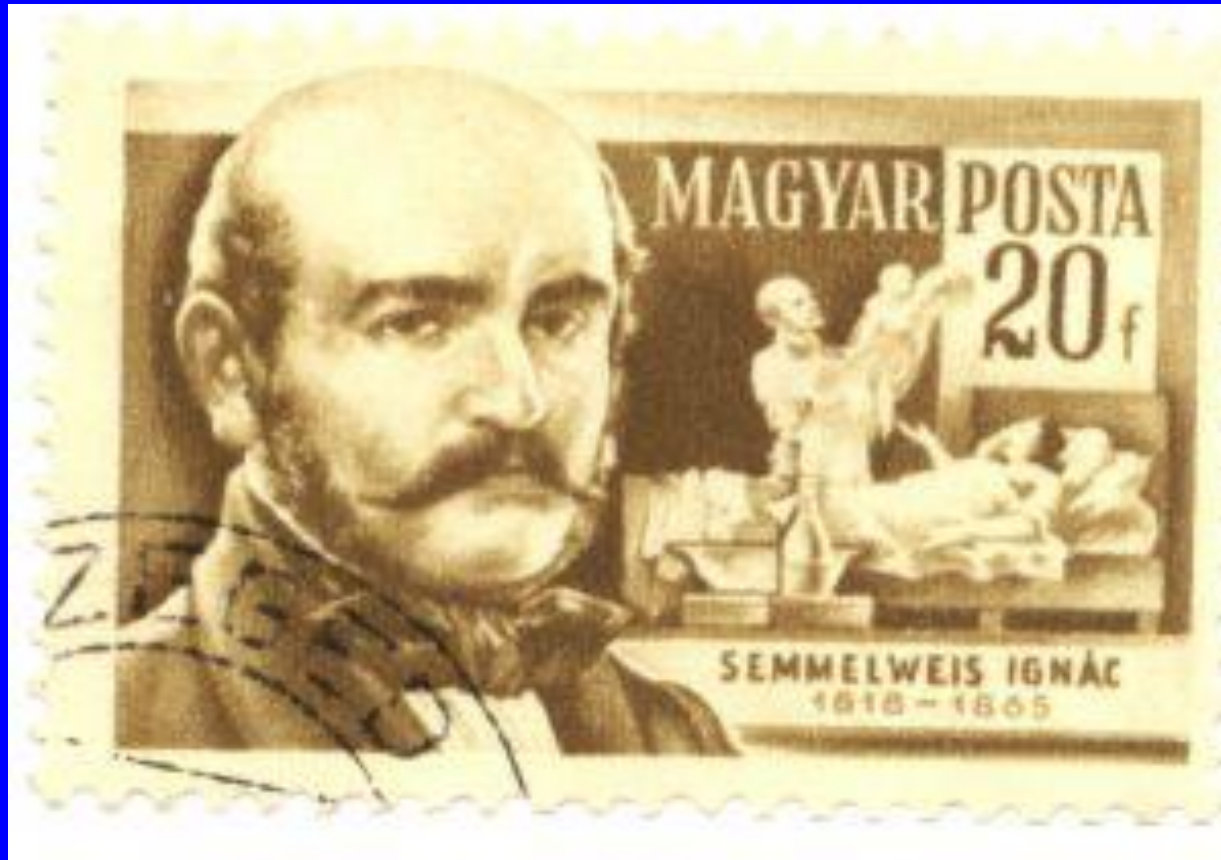
Maternal Mortality due to Postpartum Infection
General Hospital, Vienna, Austria, 1841-1850



~ Hand antisepsis reduces the frequency of patient infections ~

Adapted from: *Hosp Epidemiol Infect Control*, 2nd Edition, 1999.

Ignaz Semmelweis, 1815-1865



Hand Hygiene

- Overall compliance in observational studies is 40% (5-81%).
- Compliance usually highest among nurses and lowest among physicians.
- Hand hygiene
 - Hand washing with soap and water
 - Use of alcohol based products

Effectiveness of a comprehensive hand hygiene program for reduction of infection rates in a long-term care facility

Table 1

Summary of infection rate results

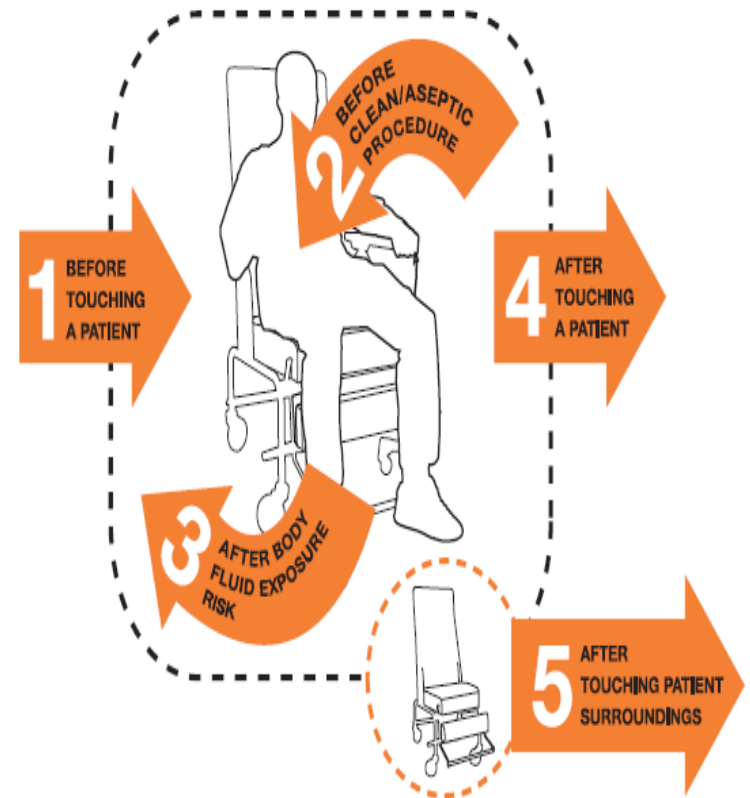
Infection type	Preintervention rate *	Postintervention rate *	Statistical analysis
Lower respiratory tract infections (Pennsylvania Patient Safety Reporting System reportable)	0.97	0.53	$P = .01$
Lower respiratory tract infections (McGeer)	0.61	0.32	$P = .03$
Skin and soft-tissue infections (Pennsylvania Patient Safety Reporting System reportable)	0.30	0.25	$P = .65$
Skin and soft-tissue infections (McGeer)	0.30	0.25	$P = .65$
Methicillin-resistant <i>Staphylococcus aureus</i>	0.53	0.55	$P = .89$
Vancomycin-resistant enterococci	0.07	0.05	$P = .80$
<i>Clostridium difficile</i>	0.08	0.04	$P = .36$
Gastrointestinal	0.10	0.09	$P = .87$

Hand Hygiene

Education Education Education

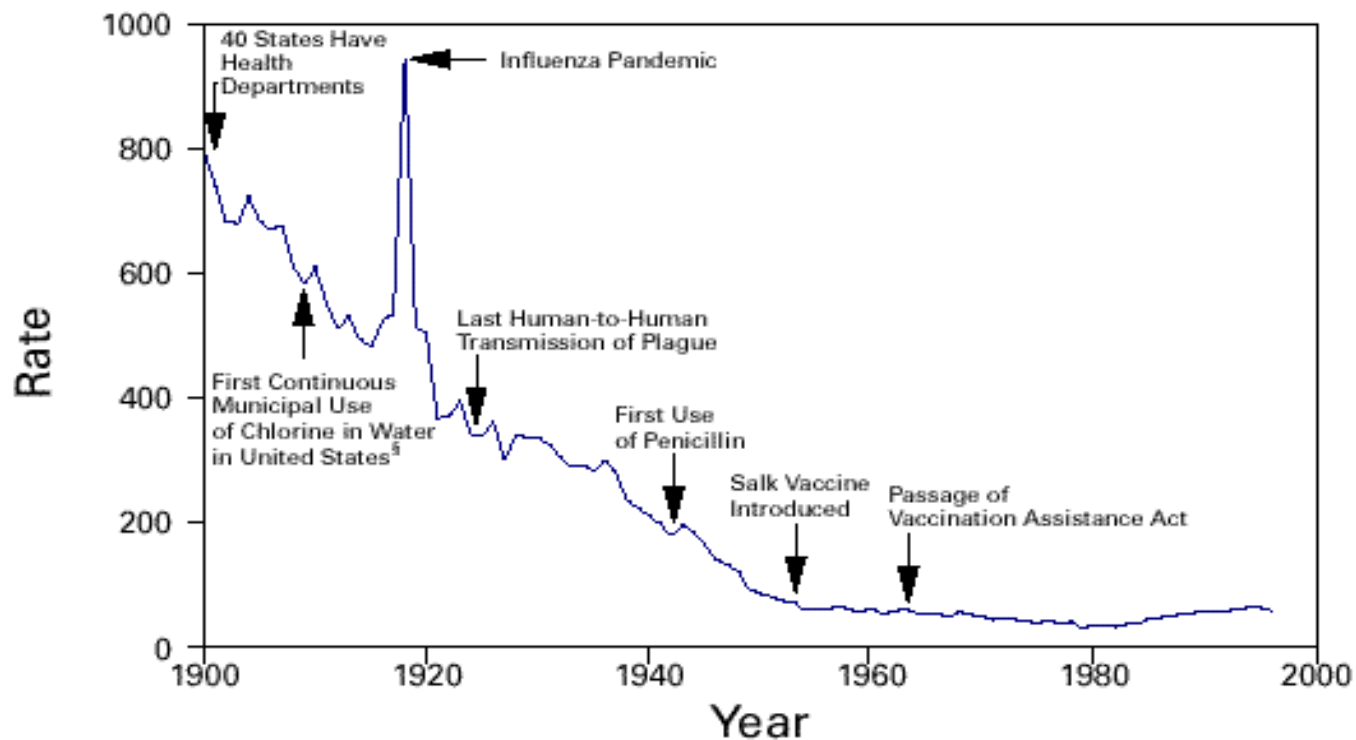
- Educational programs
- Get staff involved
 - Hand hygiene champions
 - Secret shoppers
 - Contests, posters
- Empower residents to ask if staff washed their hands

Your 5 Moments for Hand Hygiene



Infectious Diseases 1900-1996

FIGURE 1. Crude death rate* for infectious diseases — United States, 1900–1996†



*Per 100,000 population per year.

†Adapted from Armstrong GL, Conn LA, Pinner RW. Trends in infectious disease mortality in the United States during the 20th century. *JAMA* 1999;281:61–6.

§American Water Works Association. Water chlorination principles and practices: AWWA manual M20. Denver, Colorado: American Water Works Association, 1973.

Preventing HAIs Long-Term Care

Finding A Balance

- Vertical approach focuses on specific pathogens
 - Active surveillance
 - Contact precautions (colonized or infected with specific organisms)
- Horizontal approach reduces risk for broad range of infections
 - Standard precautions
 - Hand hygiene
 - Antimicrobial stewardship
 - Environmental cleaning and disinfection

Vertical Approach



**Contact
Precautions**



Clean hands with alcohol-based hand rub or soap and water








Wear gloves when providing direct care



Wear gown when providing direct care

CONTACT PRECAUTIONS **PLUS**

<u>BEFORE Entering</u>	<u>BEFORE Leaving</u>
Disinfect Hands Quick Care Foam	 Remove gown
 Put on gown (If clothes may come In contact with patient or environment)	 Remove gloves
 Put on gloves	 Soap & Water Wash

Adverse outcomes associated with contact precautions: A review of the literature

Daniel J. Morgan, MD^a, Daniel J. Diekema, MD, MS^b, Kent Sepkowitz, MD^c, and Eli N. Perencevich, MD, MSc^a

- Less patient-health care worker contact
- More noninfectious adverse events
- Increased symptoms of depression and anxiety
- Decreased patient satisfaction with care

Horizontal Transmission

USE STANDARD PRECAUTIONS FOR THE CARE OF ALL PATIENTS

STANDARD PRECAUTIONS APPLY TO: BLOOD • NON-INTACT SKIN • MUCOUS MEMBRANES • ALL BODY FLUIDS, SECRETIONS AND EXCRETIONS EXCEPT SWEAT.



WASH HANDS

Wash hands properly and thoroughly between patient contact and other contact with body fluids or soiled equipment.



WEAR GLOVES

Wear gloves when handling blood, body fluids, nonintact skin or soiled items. Change gloves between patients. Wash hands after removing gloves.



WEAR MASK

Wear a mask and eye protection or face shield to protect mucous membranes of the eyes, nose, and mouth when likely to be splashed.



WEAR GOWN

Wear a gown to protect skin and prevent soiling of clothing when likely to be splashed or sprayed. Wash hands after removing gown.



SHARPS DISPOSAL

Dispose of syringes and other sharps into a designated closed container. **Do not** break or bend needles.

A Targeted Infection Prevention Intervention in Nursing Home Residents With Indwelling Devices A Randomized Clinical Trial

- 12 Community based nursing homes
- Residents with urinary catheters and/or feeding tubes
- Intervention multimodal targeted infection program
 - Preemptive barrier precautions
 - Active surveillance for MDROs and infections
 - Staff education

A Targeted Infection Prevention Intervention in Nursing Home Residents With Indwelling Devices A Randomized Clinical Trial

- Results (intervention homes vs. usual care homes)
 - 23% reduction in MDRO prevalence among residents with indwelling devices
 - Significantly lower risk of MRSA
 - Fewer clinically diagnosed CAUTIs.

Revisiting Standard Precautions to Reduce Antimicrobial Resistance in Nursing Homes

Nimalie D. Stone, MD, MS

- Preemptive use of barrier precautions reflects an important shift in the use of gown and gloves away from a pathogen-driven model to a resident-centered model.
- Standard precautions address risk of transmission during care activities for *every* person.
- If gown and gloves are no longer associated with MDRO, this intervention might not be as stigmatizing to residents.

Finding a Balance

Residents with MDRO (DPH MA)

- Standard Precautions
 - Healthy
 - Gloves/gowns used for contact with uncontrolled secretions, pressure ulcers, draining wounds, stool incontinence, ostomy bags.
- Contact Precautions
 - Ill residents, or totally dependent, or ventilator-dependent
 - For those whose infected secretions or drainage cannot be contained

Flu Outbreaks Long-Term Care

Vaccination main intervention
to prevent onset of infection
and complications.



CDC Says Flu Vaccine Should Be More Effective This Season

- Seasonal flu vaccine offers best way to protect oneself from getting the flu and spreading it to others.



Get vaccinated

The graphic features three stylized human figures in circular frames. On the left is a woman with long dark hair, smiling, wearing a green top. In the center is a woman with short blonde hair, smiling, wearing a purple top. On the right is a man with short dark hair, smiling, wearing a blue top. The background is a light beige color.

6 MONTHS+

- Everyone 6 months of age and older should get vaccinated against the flu.

Mortality in US From Influenza

- Influenza and pneumonia are the 8th leading cause of death among Americans (7th > 65 years)
- Greater than 90% of deaths due to influenza are in those individuals older than 65 years

Efficacy of the Influenza Vaccine

- Among healthy adults, the vaccine is effective (70%-90%) in preventing illness (as long as a good match).
- Among the elderly
 - It can prevent 30%-70% of hospitalizations due to influenza/pneumonia.
 - It can reduce severe illness and complications by 60%.
 - It can prevent death by up to 80%.

Vaccination for HCP



Healthcare professionals (HCP) who are not vaccinated

- Can get influenza from contact with infected residents or infected HCP
- Can spread the illness to others

How influenza spreads

*Infectious 1 day
prior to any problems-
5-7 days after symptoms
begin.*

*Spread by droplet
Usually 3-6 feet.*



Flu Outbreaks

Stop the spread of germs that make you and others sick!

Cover your Cough



Clean your Hands after coughing or sneezing.



Wash with soap and water or clean with alcohol-based hand cleaner.



Interim Guidance for Influenza Outbreak Management in Long-Term Care Facilities

- Before an outbreak provide influenza vaccine to all residents and health care personnel (HCP)
- When influenza is in the community, conduct active daily surveillance
- Test suspected cases
- Confirmed or suspected influenza outbreak
 - Create line lists
 - Implement Standard and Droplet Precautions
 - Administer antiviral therapy to all *confirmed or suspected* residents with influenza
 - Chemoprophylaxis for all other residents
 - Institute other measures to reduce transmission (limit large group activities, limit visitation and exclude ill persons from visiting, *exclude ill HCP from working*)
 - Administer flu vaccine to unvaccinated residents and HCP



Key Points

- ANTIBIOTIC RESISTANCE is one of the world's most pressing public threats.
- Inappropriate use of antibiotics in long-term care is common.
- Need a culture change that creates a sense of urgency among staff about prescribing.
- Antibiotic stewardship programs in long-term care can decrease MDRO and *C difficile* infections.

Key Points

- Routine screening for and treatment of asymptomatic bacteriuria is not recommended in elderly residents in LTCFs.
- Treat only symptomatic urinary tract infections in the elderly.
- Many respiratory infections do not need antibiotics.
- *Clostridium difficile* infections are on the rise and are associated with increased mortality especially among the elderly.

Key Points

- We need to find a balance between horizontal and vertical approaches to preventing HAIs
- Influenza is associated with increased morbidity and mortality in our elderly population.
- **GET YOUR FLU SHOT TODAY!**