

Antibiotic Stewardship in Long-Term Care and the CDC Core Elements



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1928 – Alexander Fleming discovered a mold with bacteria killing properties

Introduction of Antibiotics

“For most of the infectious diseases on the wards of Boston City Hospital in 1937, there was nothing to be done beyond bed rest and good nursing care.”



Photo credit, **LIFE**

Lewis Thomas. *The Youngest Science*



Introduction of Antibiotics (cont.)

“I remember the astonishment when the first cases of pneumococcal and streptococcal septicemia were treated in Boston in 1937. The phenomenon was almost beyond belief. Here were moribund patients, who would surely have died without treatment, improving in their appearance within a matter of hours of being given the medicine and feeling entirely well within the next day or so....we became convinced, overnight, that nothing lay beyond reach for the future. Medicine was off and running.”

Lewis Thomas. *The Youngest Science*

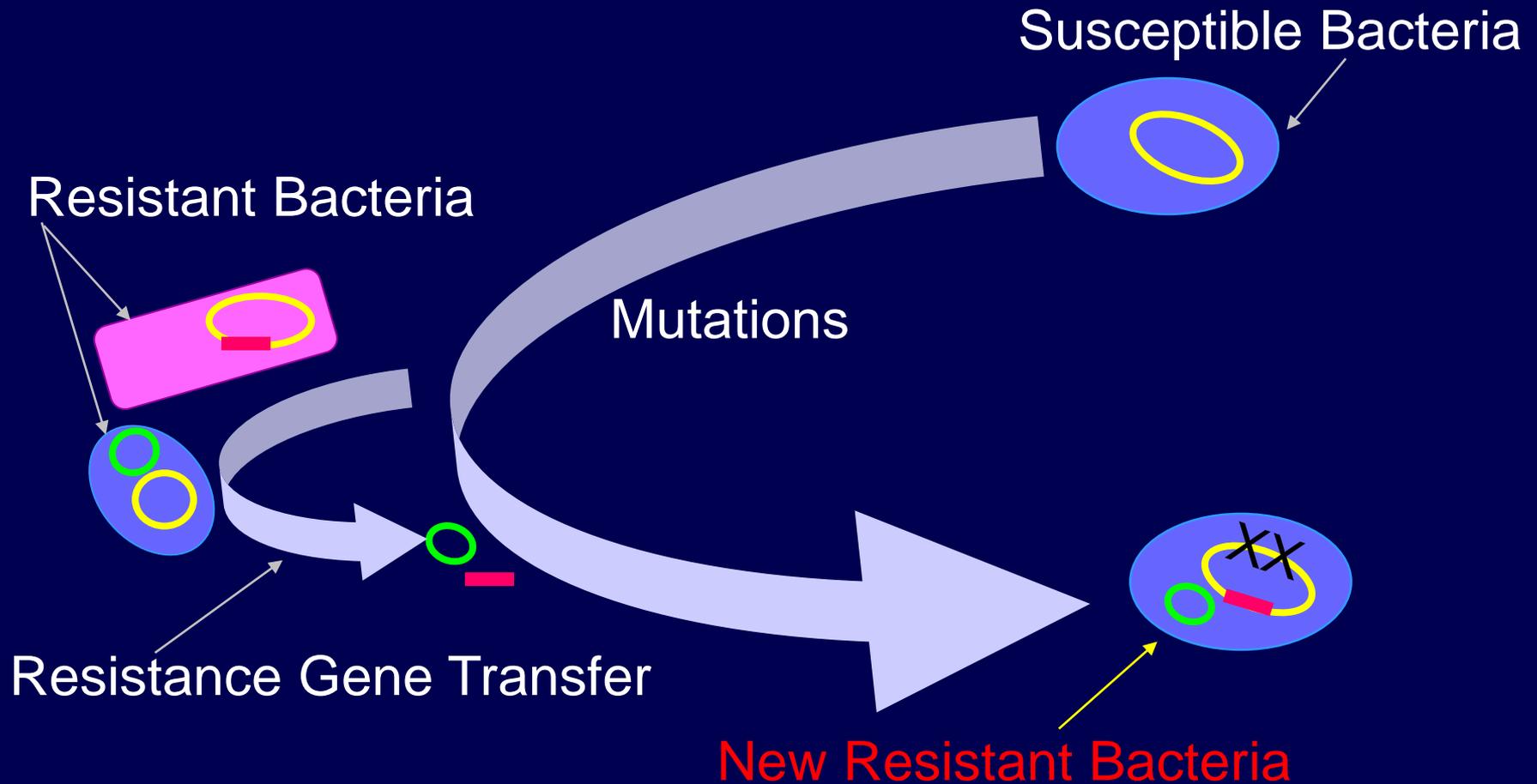
The Power of Effective Antibiotics

Disease	Pre-Antibiotic Death Rate	Death with Antibiotics	Change in Death
Community Pneumonia ¹	~35%	~10%	-25%
Hospital Pneumonia ²	~60%	~30%	-30%
Heart Infection ³	~100%	~25%	-75%
Brain Infection ⁴	>80%	<20%	-60%
Skin Infection ⁵	11%	<0.5%	-10%
<i>By comparison...treatment of heart attacks with aspirin or clot busting drugs⁶</i>			-3%
<small>¹IDSA Position Paper '08 Clin Infect Dis 47(S3):S249-65; ²IDSA/ACCP/ATS/SCCM Position Paper '10 Clin Infect Dis In Press; ³Kerr AJ. Subacute Bacterial Endocarditis. Springfield IL: Charles C. Thomas, 1955 & Lancet 1935 226:383-4; ⁴Lancet '38 231:733-4 & Waring et al. '48 Am J Med 5:402-18; ⁵Spellberg et al. '09 Clin Infect Dis 49:383-91 & Madsen '73 Infection 1:76-81; ⁶88 Lancet 2:349-60</small>			

Antibiotic Resistance

- Ability of bacteria to withstand the effects of antibiotics
- Resistance may occur by a change in gene product(s)
 - Spontaneous point mutations
 - Genetic rearrangements on the bacterial chromosome
 - Acquisition of foreign DNA

Emergence of Antimicrobial Resistance





Selective Pressure

- Bacteria exposed to antibiotic → susceptible cells die
 - Resistant bacteria survive
- Reduced competition from susceptible bacteria allows resistant bacteria to thrive and outcompete
- Antibiotics impact “normal flora”
 - Limit the space for pathogenic bacteria
- Non-pathogenic resistant bacteria impact antibiotic resistance
 - Increasing the reservoir of resistance genes

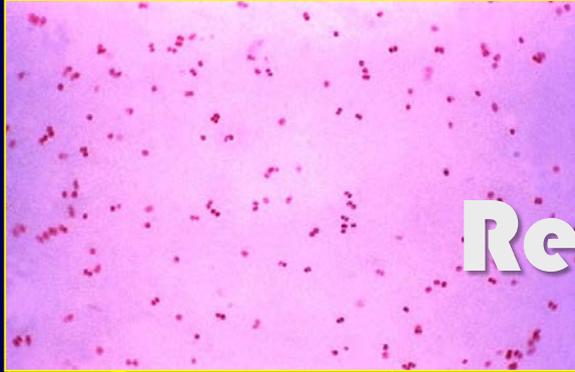
Antibiotic Resistance

- Antibiotic use is associated with colonization or infection with resistant bacteria (e.g., pneumococcus, *S. aureus*)
- Resistance is an individual and public health issue
- Resistant infections
 - More difficult to treat
 - Broader spectrum therapy
 - May require parenteral therapy
 - Therapy might increased toxicities and adverse effects

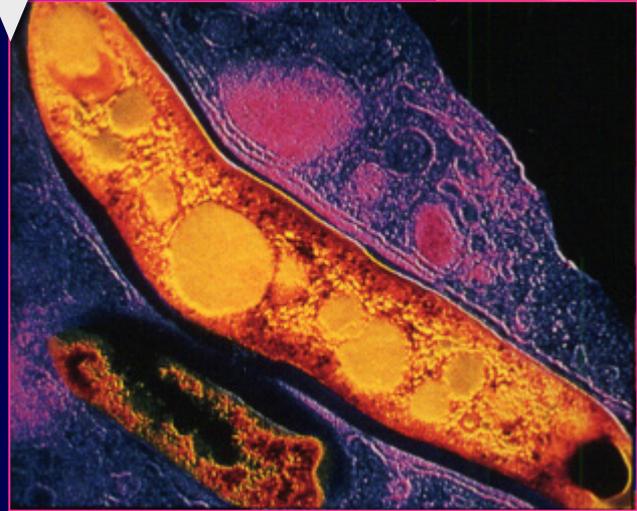
Salmonella
Typhimurium
DT104



Resistant HIV



quinolone resistant gonorrhoea

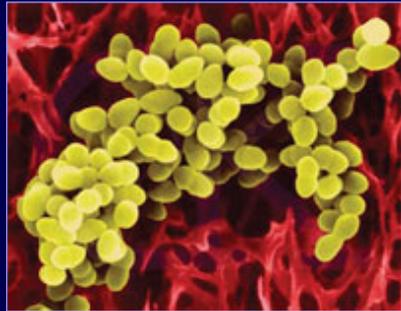


ACINETOBACTER

MRSA

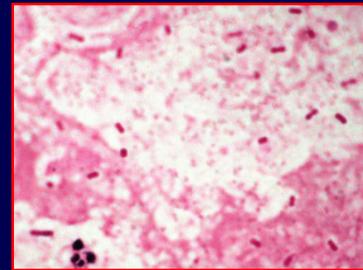
XDR TB

CARBAPENEM RESISTANT ENTEROBACTERIACEAE

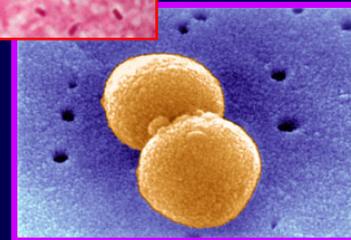


Candida glabrata

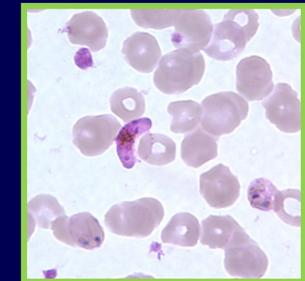
multi-drug resistant malaria



C. difficile



MDR S. pneumoniae



The new generation of resistant infections is almost impossible to treat

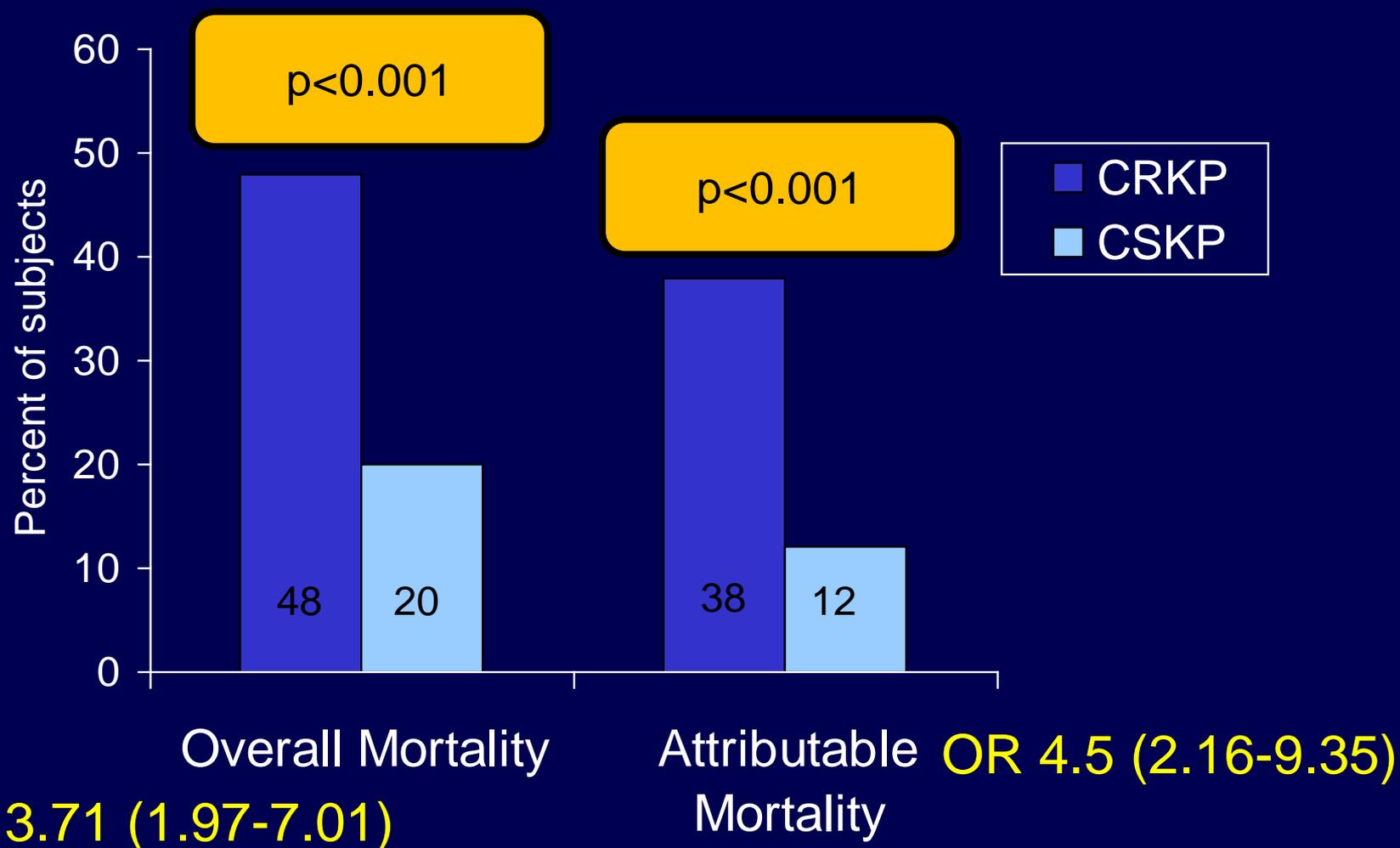
In August, 2000, Dr. Roger Wetherbee, an infectious-disease expert at New York University's Tisch Hospital, received a disturbing call from the hospital's microbiology laboratory. At the time, Wetherbee was in charge of handling outbreaks of dangerous microbes in the hospital, and the laboratory had isolated a bacterium called *Klebsiella pneumoniae* from a patient in an intensive-care unit. “It was literally resistant to every meaningful antibiotic that we had”



Susceptibility Profile of *Klebsiella pneumoniae* carbapenamase (KPC) Producing *K. pneumoniae*

<u>Antimicrobial</u>	<u>Interpretation</u>	<u>Antimicrobial</u>	<u>Interpretation</u>
Amikacin	I	Chloramphenicol	R
Amox/clav	R	Ciprofloxacin	R
Ampicillin	R	Ertapenem	R
Aztreonam	R	Gentamicin	R
Cefazolin	R	Imipenem	R
Cefpodoxime	R	Meropenem	R
Cefotaxime	R	Pipercillin/Tazo	R
Cetotetan	R	Tobramycin	R
Cefoxitin	R	Trimeth/Sulfa	R
Ceftazidime	R	Polymyxin B	MIC >4µg/ml
Ceftriaxone	R	Colistin	MIC >4µg/ml
Cefepime	R	Tigecycline	S

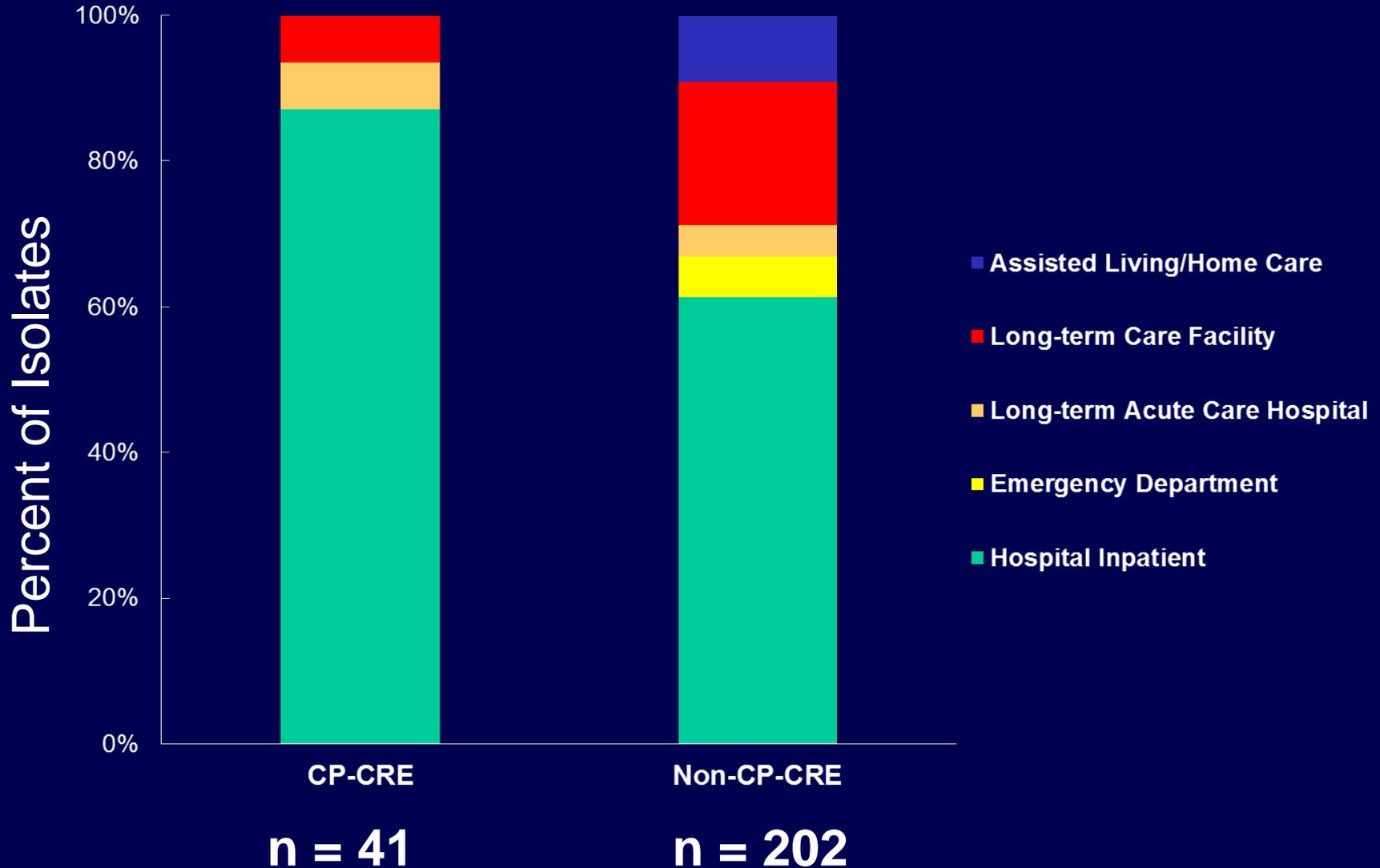
Mortality: Carbapenem Resistant vs. Susceptible *Klebsiella pneumoniae*



Patel et al. Infect Control Hosp Epidemiol 2008;29:1099-1106

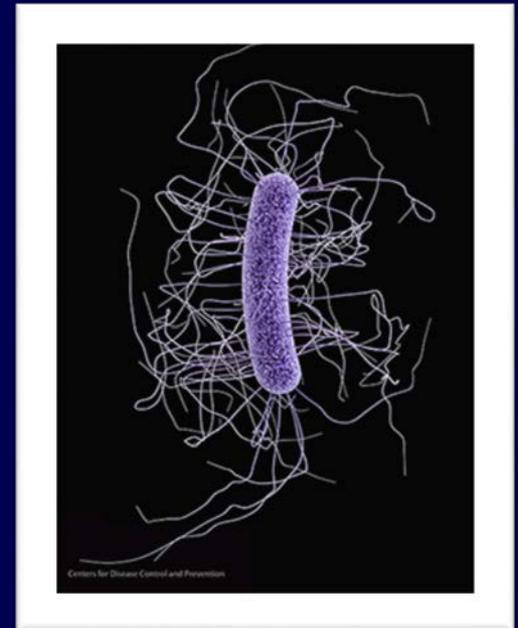
A. Srinivasan, J. Patel – DHQP CDC

CP-CRE and Non CP-CRE Isolates by Patient Location, Minnesota, 2015

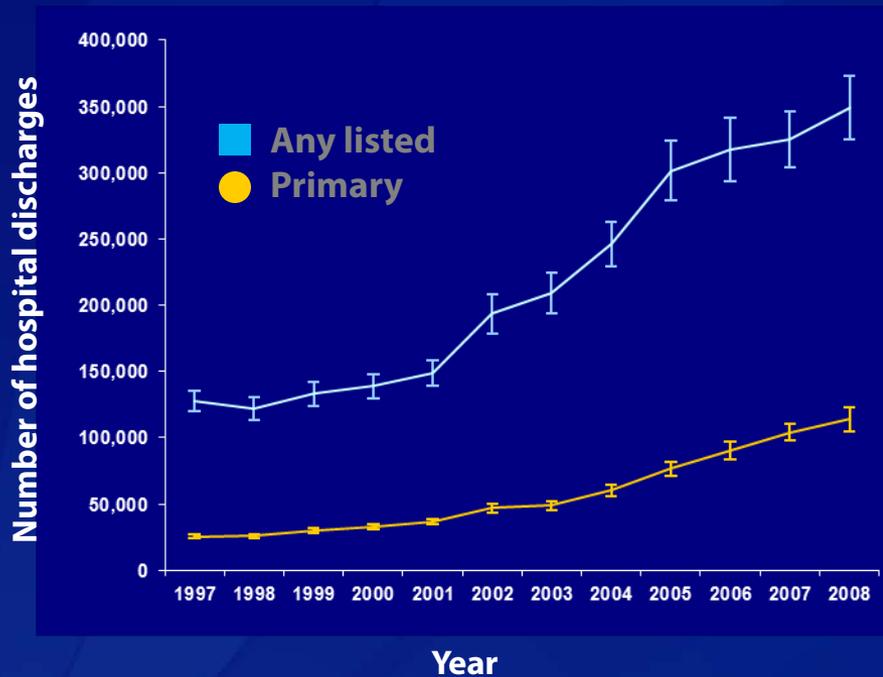


Clostridium difficile Infection

Antibiotic exposure is the most important risk factor for the development of *Clostridium difficile*-associated disease



Estimated Burden of Healthcare-Associated *C. difficile* in U.S.



- **Hospital-acquired, hospital-onset:** 165,000 cases, \$1.3 billion in excess costs, and 9,000 deaths annually
- **Hospital-acquired, post-discharge (up to 4 weeks):** 50,000 cases, \$0.3 billion in excess costs, and 3,000 deaths annually
- **Nursing home-onset:** 263,000 cases, \$2.2 billion in excess costs, and 16,500 deaths annually

Elixhauser, A. (AHRQ), and Jhung, MA. (Centers for Disease Control and Prevention). *Clostridium Difficile-Associated Disease in U.S. Hospitals, 1993–2005*. HCUP Statistical Brief #50. April 2008. Agency for Healthcare Research and Quality, Rockville, MD. And unpublished data <http://www.hcup-us.ahrq.gov/reports/statbriefs/sb50.pdf>

Campbell et al. *Infect Control Hosp Epidemiol*. 2009;30:523-33.
Dubberke et al. *Emerg Infect Dis*. 2008;14:1031-8.
Dubberke et al. *Clin Infect Dis*. 2008;46:497-504.



HAIs in Nursing Homes

- 1.8-3.6 million HAIs in NHs/year
 - 150,000 hospitalizations, 388,000 deaths
 - \$673 million - \$2 billion in excess healthcare costs

Issues:

- Residents have co-morbidities, functional impairments, frail, multiple medications
- Faster discharge from acute care
 - Residents often have invasive devices (ventilators, central lines, feeding tubes) and greater medical needs
 - Multiple providers
- Nursing home also their home

Antibiotic Use in NHs

- Up to 70% of residents receive ≥ 1 systemic antibiotic/year
- 40–75% might be unnecessary or inappropriate
- Adverse consequences
 - *C. difficile*
 - Adverse drug events and drug interactions
 - Colonization and/or infection with antibiotic-resistant organisms
 - Increased costs of care
- Common misuse: treating asymptomatic bacteriuria, viral respiratory infection (acute bronchitis), colonization instead of infection

NH Antibiotic Use, Ontario 2010

- 630 LTCFs (66,900 residents)
- Approximately 20% of prescribers prescribed 80% of the antibiotics
- Long duration of antibiotics (>7 days) was associated with individual prescribers, though patient characteristics were similar

Antibiotic Misuse in LTC

Resident Factors

- Chronic medical conditions, debilitation
- Impaired communication
- Difficulty obtaining specimens
- Family concerns

System Factors

- Lack of care continuity
- Time constraints and limited staffing
- Limited diagnostic resources
- Staff turnover

Provider Factors

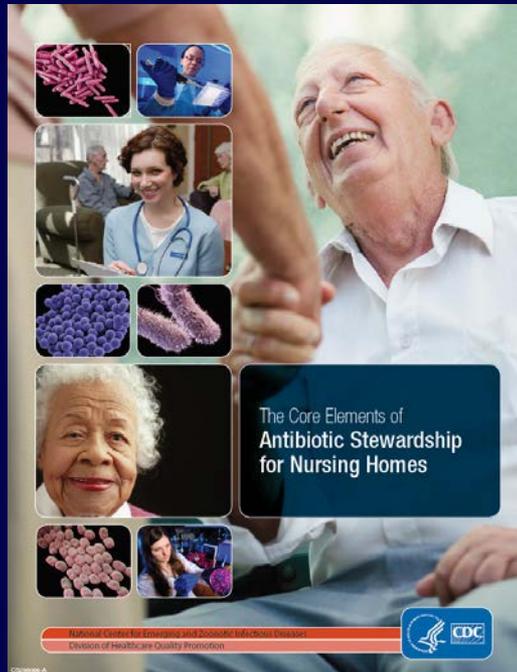
- Telephone ordering
- Limited direct evaluation
- Lack of access to information at time of decision making

Antibiotic Stewardship Program (ASP)

- Stewardship: “careful and responsible management of something entrusted to one's care” –Merriam-Webster Dictionary
- Antimicrobial stewardship: improving use of antimicrobials through coordinated interventions
 - Appropriate diagnosis, drug, dose, de-escalation, and duration of treatment using evidence-based guidelines
 - Assist residents in managing symptoms of non-bacterial infections
- In order to be effective, must include all levels of healthcare workers and education to residents and family members
- Infectious Disease consult-supported ASP in LTC has led to decreased antibiotic use and decrease in *C. difficile* infections*

*Jump. ICHE 2012; 33:1185-92

Putting Stewardship into Practice



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

1: Administrative Leadership and Commitment



Leadership commitment

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

- Identify relevant administrative leadership
 - Communicate the importance of antibiotic stewardship commitment
 - Outline CMS rules and other applicable requirements
 - Consider discussing costs associated with treating resistant and *C. difficile* infections
- Establish how commitment to antibiotic stewardship will be communicated to staff, residents, and families
 - Posters in the facility
 - Family and resident discussions at admission, at regular intervals, and when illness occurs
 - Annual staff communication about commitment and expectations
- Consider engaging administrative leadership to identify facility ASP leader
- Begin plans to draft an antibiotic stewardship policy
 - Include facility goals and objectives

2: Accountability



Accountability

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

- Often a physician, prescriber, or pharmacist will lead the antibiotic stewardship team (AST)
- Define the team's overall purpose and responsibilities
- Identify staff members and tasks
- Use CDC's Core Elements of Antibiotic Stewardship for Nursing Homes document to guide AST discussion
 - Medical, nursing, pharmacist, infection prevention, laboratory roles
- Consider how often the AST will review data (e.g., monthly, quarterly)

Team Responsibilities



Accountability

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

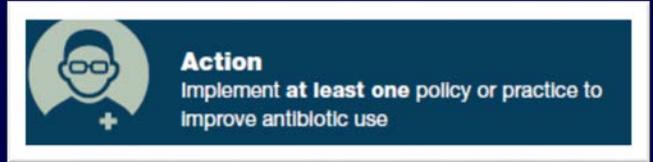
- Policy and procedure development
- Tracking and reporting protocols and reports for antibiotic use and outcomes
 - Internal review
 - Consulting pharmacist review
- Nursing responsibilities
 - Standardized documentation and sharing of patient information
 - Communication protocols
 - Practice protocols (e.g., antibiotic time-outs, urine testing)

3: Drug Expertise



- Nursing homes should establish access to individuals with antibiotic expertise
 - Within referral network
 - New relationships with consultants in community
- Support from consultants can help reduce antibiotic use and adverse outcomes like *C. difficile* infection
 - Infectious disease physicians
 - Pharmacists with infectious disease or antibiotic stewardship training
- This provides an opportunity to establish relationships with other facilities connected to you through referrals or transfers

4: Action



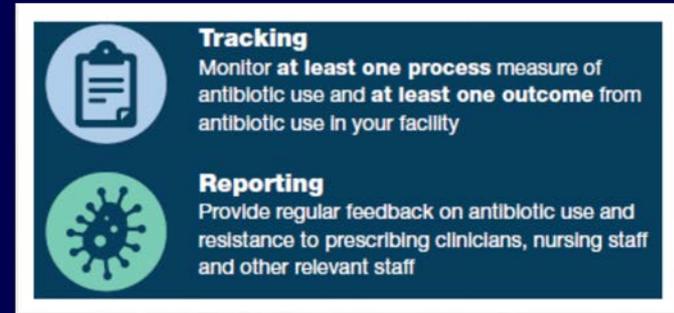
- Implementation of policies and practices to improve antibiotic use
- Identify priority interventions on which to focus first
- Actions can be implemented with stepwise approach
- Consider identifying actions for this year and proposed actions for next year

Action Examples



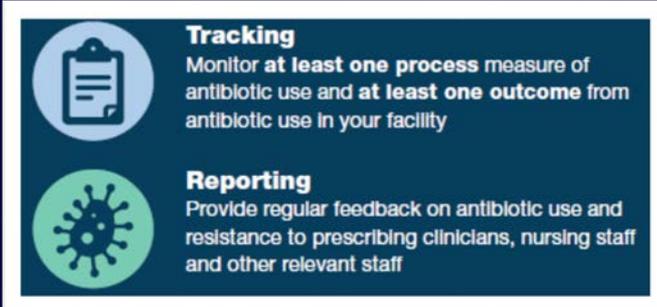
- Baseline actions
 - Record-keeping requirements
 - Regular antibiotic use tracking and reporting
 - Standardized nursing communication protocols (SBAR)
 - Antibiotic “time-outs” to review antibiotic appropriateness, need for de-escalation
 - Protocols to improve management of asymptomatic bacteriuria/urinary tract infections
- More advanced actions
 - Tracking of antibiotic use appropriateness (e.g., Loeb minimum criteria for antibiotic use)*
 - Pharmacy-level interventions
 - Policies limiting use of specific antibiotics (e.g., fluoroquinolones)
 - Establishment of facility-specific first-line prescribing guidelines
 - Additional syndrome-specific interventions
 - Use of facility/regional antibiogram to guide prescribing

5-6. Tracking and reporting



- Monitor antibiotic use practices, outcomes
 - Track progress
 - Guide changes to protocol
- Reporting facilitates awareness and accountability among administration, staff
- Feedback can drive prescribing improvement if communicated in ways acceptable to prescribers
- Measurement types:
 - **Process measures**
 - **Antibiotic use measures**
 - **Outcome measures**

Process Measures



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

- Tracking processes that influence how antibiotics are prescribed
- Use of nursing communication protocols
- Compliance with antibiotic initiation protocols
- Completeness of prescription documentation (dose, duration, route, indication)

Antibiotic Use Measures



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

- Tracking how many antibiotics are prescribed
 - Antibiotic starts
 - Days of therapy
 - Cost
 - Length of therapy
 - Point prevalence
- Manual or electronic tracking can be used

Table 1
Antibiotic Use and Cost Metrics for Long-Term Care Facilities

Metric	Definition*	Advantages	Disadvantages
Incidence	Number of antibiotic courses started per 1000 resident care days	Provides rate of number of residents treated each month Useful to monitor impact of interventions to lower use	Not a measure of length of therapy Requires resident-level data
Antibiotic utilization ratio	Ratio of total antibiotic days to total resident care days	Most common metric used in published studies (usually expressed as total days per 1000 resident days) Used by CDC NHSN Useful to monitor impact of interventions to lower use	Not a measure of length of therapy Requires resident-level data
Cost per antibiotic day	Ratio of total antibiotic cost to total antibiotic days	May provide insight into prescribing of high cost antibiotics	Requires cost data and resident-level data
Cost per resident care day	Ratio of total antibiotic cost to total resident care days	May appeal to administrators because it relates cost to whole population	Requires cost data Not all residents treated with an antibiotic

CDC NHSN, Centers for Disease Control and Prevention National Healthcare Safety Network.
*Metric calculated on a monthly basis.

Outcome Measures



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

- Tracking outcomes that might be related to or influenced by antibiotic use
 - Urinary tract infections
 - *Clostridium difficile* infection rates by using CDC's NHSN criteria
 - Infections with antibiotic-resistant organisms
 - Adverse drug events

7: Education



Education

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

- Antibiotic stewardship education is needed for clinicians, nursing staff, residents, and families
- Platforms for education can include:
 - Fliers and newsletters
 - Trainings, conferences, workshops
- CDC suggests linking professional education to feedback on prescribing practices
- Spending time to explain why the facility has a commitment to stewardship will help to change resident and family member expectations

Education Tools for Residents, Families

AHRQ Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

Topics Programs Research Data Tools Funding & Grants News & Events About

Home > Nursing Home Antimicrobial Stewardship Guide > Toolkits

Nursing Home Antimicrobial Stewardship Guide

- About the Guide
- Toolkits
 - Implement, Monitor, and Sustain an Antimicrobial Stewardship Program
 - Determine Whether It Is Necessary To Treat a Potential Infection With Antibiotics
 - Help Prescribing Clinicians Choose the Right Antibiotic
 - Educate and Engage Residents and Family Members

Toolkit To Educate and Engage Residents and Family Members

Overview of the Toolkit

Why Should a Nursing Home Use This Toolkit?

The Resident and Family Member Education toolkit helps the nursing home (1) encourage an open and respectful dialogue between nurses and prescribing clinicians and residents and their family members, and (2) help residents and family members participate in their care.

What Is Included In the Toolkit?

The toolkit provides ways to educate residents and their family members about antibiotics and the risks involved with taking antibiotics, including Clostridium difficile (or C. diff) and antibiotic resistance. The toolkit includes the following tools:

TOOLKIT EFFECTIVENESS

This toolkit is based on similar toolkits used in nursing homes and hospitals. Anticipated feedback from the field will help evaluate the effectiveness of this toolkit.

AUTHORS

This toolkit was created by the American Institutes for Research, Texas A & M University Health Science Center, University of Wisconsin, TMF Health Quality Institute, Trivedi Consults, LLC, University of Pittsburgh, and David Mehr, M.D., for the Agency for

AHRQ AS Education Toolkit for Long-term Care
<https://www.ahrq.gov/nhguide/toolkits/educate-and-engage/index.html>

Core Elements for Antibiotic Stewardship in Nursing Homes

What You Need to Know About Antibiotics in a Nursing Home

What are antibiotics?
Antibiotics are drugs used to treat infections caused by bacteria. They do not work for

What is antibiotic stewardship?
Antibiotic stewardship refers to a set of coordinated activities designed to make the right dose, of the right amount of time, and necessary. Improving use these life-saving antibiotics, which in

antibiotic stewardship is important for
Residents have a higher risk of infections for many reasons. The devices such as urinary tubes, wounds, and the bladder (e.g., diabetes) colonization. Difficulties of bacteria from their adults can lead to antibiotic resistance.

continued on next page

Core Elements for Antibiotic Stewardship in Nursing Homes

Top 10 Infection Prevention Questions to Ask a Nursing Home's Leaders

- 1. What infections commonly occur among residents in this facility?**
Why is this question important? Nursing home residents can have a higher chance of getting an infection due to frailty from getting older, needing more help from caregivers who may not have clean hands, and open wounds or medical devices like IV tubes going into their body that break the skin providing a path for germs to enter the body. A nursing home should be tracking the common infections in its residents so they can be sure that actions are taken (i.e., infection prevention practices) to reduce the spread of germs to residents.
- 2. When was the last outbreak (i.e., infection spreading among residents) in this facility?**
What was the cause (e.g., flu, norovirus, other)?
Did the facility request assistance from local public health authorities or any other partners?
Why are these questions important? Shared living spaces and lots of visitors can make it easier for a contagious germ (like flu or diarrhea from norovirus) to spread quickly through a nursing home. While many facilities experience outbreaks, early detection and quickly alerting public health authorities can help limit the spread of the infection to more residents, staff and visitors.
- 3. How does the facility communicate with residents, family and visitors when an outbreak occurs?**
Why is this question important? Outbreaks of infections do occur in nursing homes. It is important the facility staff have a process for notifying residents, family members and visitors so everyone can take steps to decrease the chance of spreading the infection or getting ill. Sometimes a facility might have to restrict visitation or stop new admissions temporarily in order to stop an outbreak. In those situations, it's very important that everyone is informed about what is happening.
- 4. Is the flu vaccine mandatory for all staff working in this nursing home?**
What percentage of your staff received the flu vaccine this year (or last year)?
Why are these questions important? A growing number of healthcare facilities are making flu shots a requirement for staff as a measure to protect patients and staff from flu. In nursing homes, giving a flu vaccine to staff can help reduce the spread of flu to residents. Even if a flu vaccine isn't mandatory for staff, all staff should be offered the vaccine and a nursing home should know how many of their staff received the vaccine during the last flu season. The nursing home should also know what percentage of residents received the flu vaccine during the last flu season.

Centers for Disease Control and Prevention
National Center for Emergency and Zoonotic Infectious Diseases

Centers for Disease Control and Prevention
<https://www.cdc.gov/longtermcare/prevention/antibiotic-stewardship.html>



Checklist for Core Elements of Antibiotic Stewardship in Nursing Homes

The following checklist is a companion to the Core Elements of Antibiotic Stewardship in Nursing Homes. The CDC recommends that all nursing homes take steps to implement antibiotic stewardship activities. Before getting started, use this checklist as a baseline assessment of policies and practices which are in place. Then use the checklist to review progress in expanding stewardship activities on a regular basis (e.g., annually). Over time, implement activities for each element in a step-wise fashion.

LEADERSHIP SUPPORT

**ESTABLISHED
AT FACILITY**

1. Can your facility demonstrate leadership support for antibiotic stewardship through one or more of the following actions?

Yes

No

If yes, indicate which of the following are in place (select all that apply)

- Written statement of leadership support to improve antibiotic use
- Antibiotic stewardship duties included in medical director position description
- Antibiotic stewardship duties included in director of nursing position description
- Leadership monitors whether antibiotic stewardship policies are followed
- Antibiotic use and resistance data is reviewed in quality assurance meetings

How are we doing in Minnesota?





CDC Nursing Home Prevalence Pilot, 2013-14

- Single day HAI and AU prevalence survey pilot
 - 9 NHs in 4 EIP sites: CT, MN, NM, NY
 - Eligibility: CMS certified nursing facilities, >100 licensed beds, voluntary participation
- Enrolled, completed data collection at 9 NHs
 - Median licensed beds 130 (range 104 – 229)
 - Total of 1272 eligible residents (98% of all residents)
 - Median age 85 years (22 – 91)
 - 14% short stay

Thompson ND. JAMDA 2016; 17: 1151-53; Epstein L. ICHE 2016; 37:1440-5.

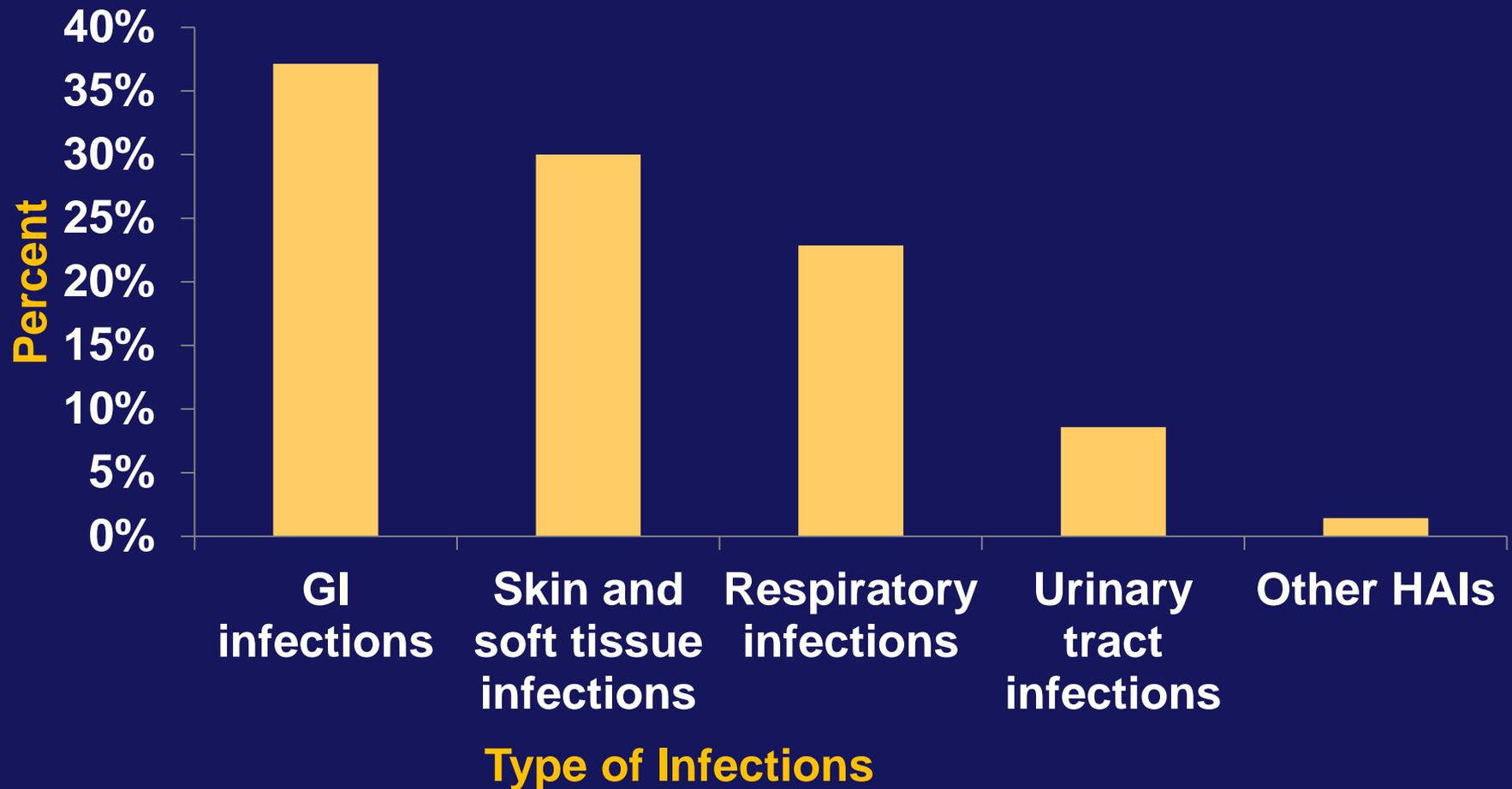
HAI and AU Prevalence by Resident Characteristic

		<u>HAI Prev.</u>	<u>(95% CI)</u>	<u>AU Prev.</u>	<u>(95% CI)</u>
Overall		5.3	(4.6 – 6.6)	11.1	(9.4 – 12.9)
			χ^2 p-value		χ^2 p-value
Age:	0-84	4.5	0.143	12.5	0.2186
	85 +	6.3		10.4	
Gender:	Male	5.3	1.000	11.7	0.788
	Female	5.2		11.2	
Diabetes:	No	5.7	0.270	11.3	0.8834
	Yes	4.1		11.6	
Stay:	Long	4.7	0.031	9.7	<0.01
	Short	8.7		21.2	
Device*:	No	4.8	0.018	10.3	<0.01
	Yes	10.8		23.5	

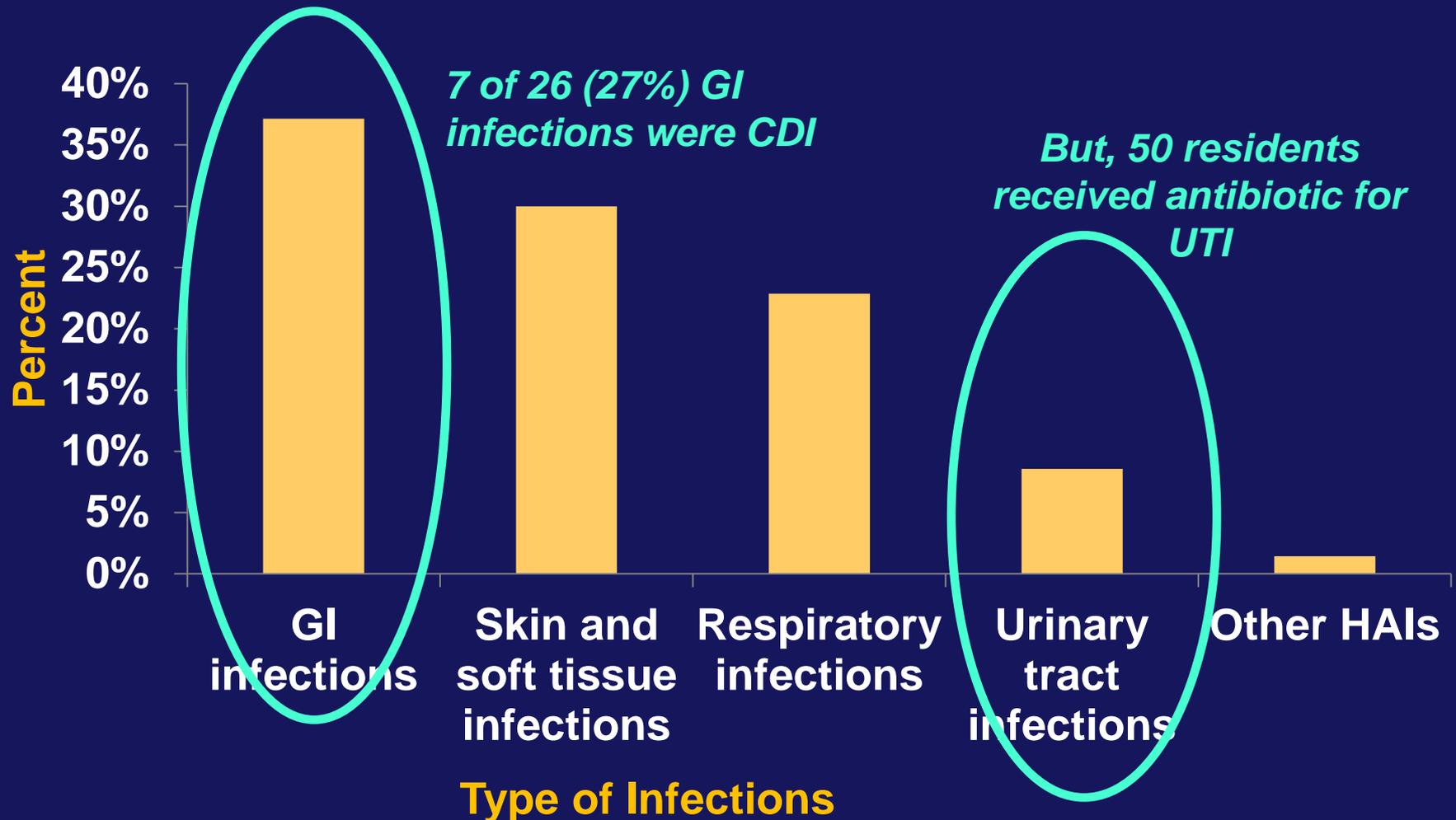
*Indwelling urinary catheter, vascular device, ventilator or tracheostomy, PEG/J tube

Thompson ND. JAMDA 2016; 17: 1151-53; Epstein L. ICHE 2016; 37:1440-5.

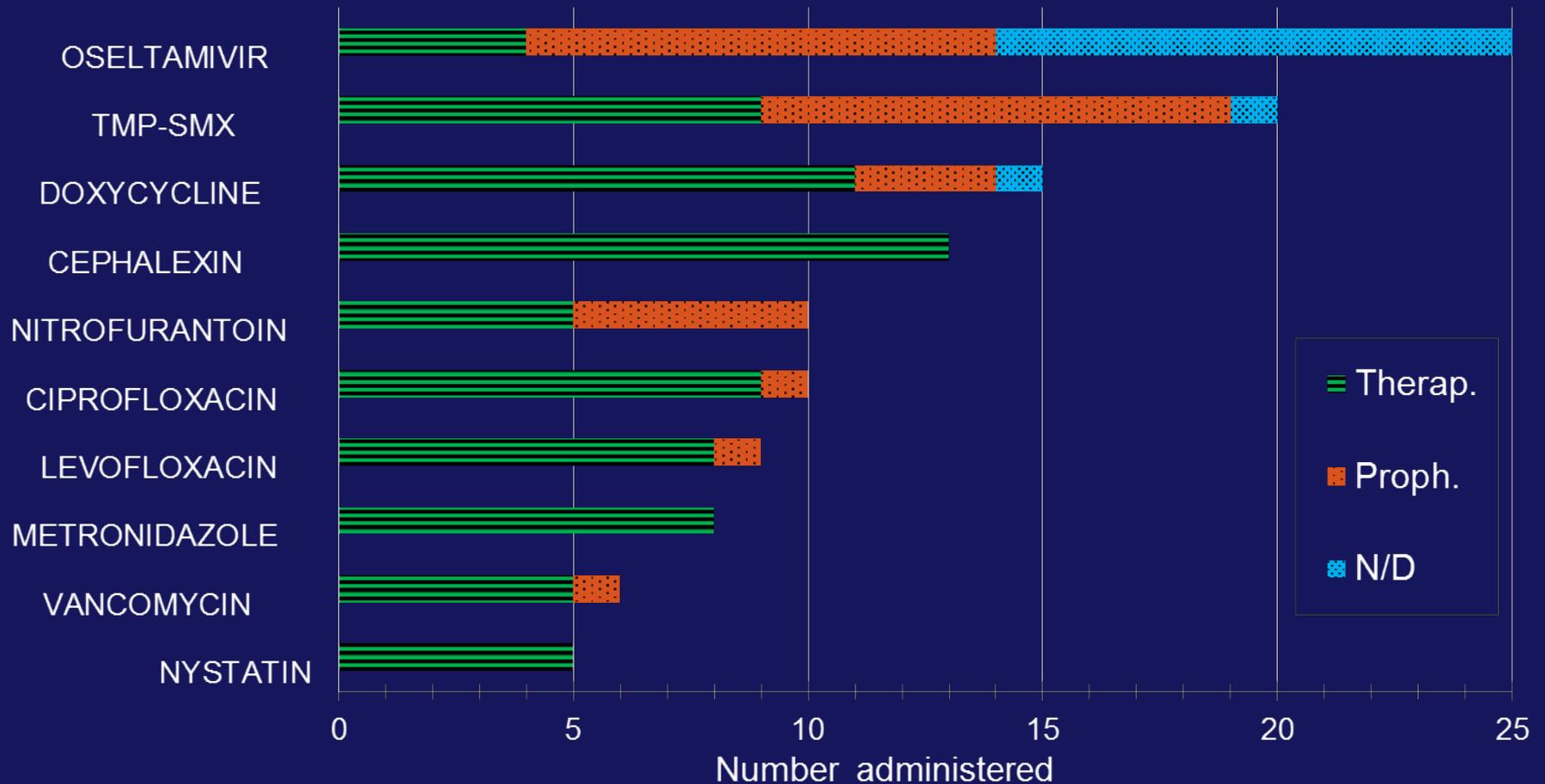
HAI in Nursing Homes (N=70 infections, 67 residents)



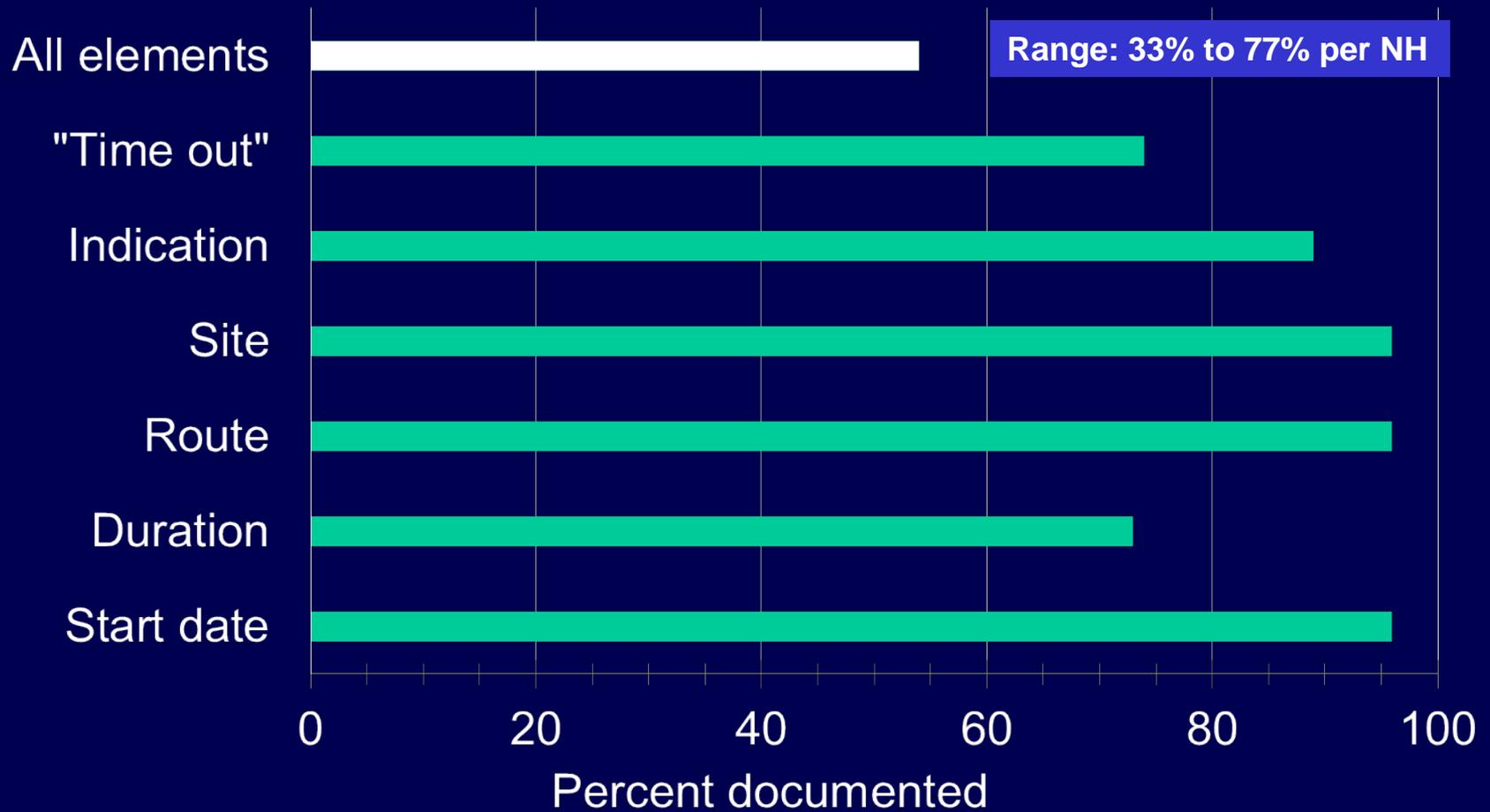
HAI in Nursing Homes (N=70 infections, 67 residents)



Top 10 Antimicrobials Administered in 9 US Nursing Homes



Documentation of Antimicrobial Prescribing Practices

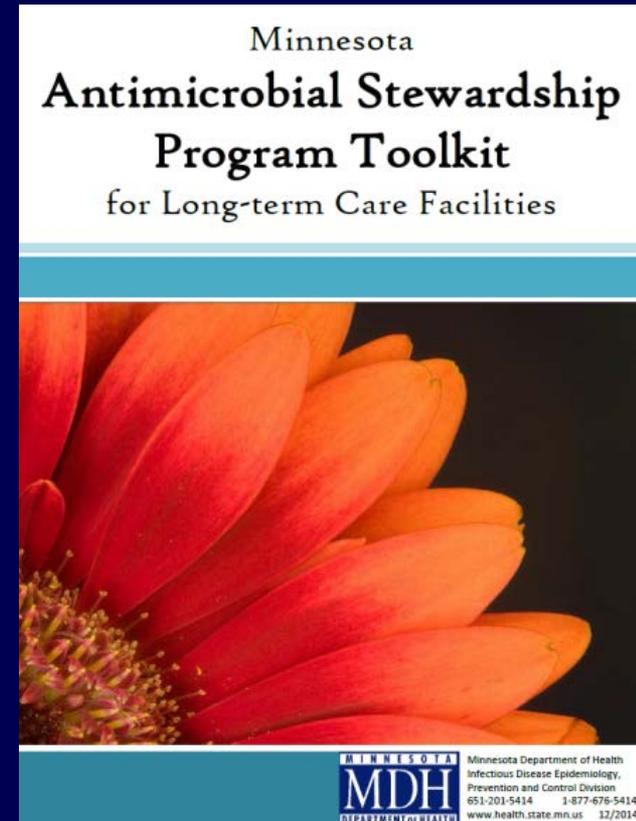


Evaluation of Antibiotic Appropriateness Measures for UTI

- Study assessed appropriateness of initiating antibiotics for NH residents in 4 states (n=49)
 - 3 published algorithms: Loeb, McGreer, Crnich
- 33/49 received treatment
 - Appropriateness varied: 15–45%
 - Opportunities exist for improving prescribing
- 16/49 (32%) received prophylaxis
 - Antibiotic prophylaxis for UTI is likely unnecessary
 - Additional evaluation is needed
- Improvement of antibiotic use for UTI could have large impact on overall use

MN ASP for Long-Term Care Core Tools

- Action steps and strategies:
 - How to implement ASP
- Gap analysis:
 - Readiness for ASP
- Surveys:
 - Attitudes and beliefs of nursing staff, providers on antibiotic-use
 - Who gets antibiotics and why
- Evaluation tool:
 - Improve quality of nursing assessment, communication, documentation of resident symptoms



Released Summer 2014

Collaborations for LTC

- MDH partners with groups working on LTC stewardship
 - Quality improvement organization (QIO)
 - Hospital association
 - Aging services professional organizations
 - Medical directors
 - Infection preventionists
- LTC stewardship workgroup developed to work on informatics and on prescribing issues
 - E-health experts
 - Consulting pharmacists

Fighting Resistance

- 1 PREVENTING INFECTIONS, PREVENTING THE SPREAD OF RESISTANCE**


Avoiding infections in the first place reduces the amount of antibiotics that have to be used and reduces the likelihood that resistance will develop during therapy. There are many ways that drug-resistant infections can be prevented: immunization, safe food preparation, handwashing, and using antibiotics as directed and only when necessary. In addition, preventing infections also prevents the spread of resistant bacteria.
- 2 TRACKING**


CDC gathers data on antibiotic-resistant infections, causes of infections and whether there are particular reasons (risk factors) that caused some people to get a resistant infection. With that information, experts can develop specific strategies to prevent those infections and prevent the resistant bacteria from spreading.
- 3 IMPROVING ANTIBIOTIC PRESCRIBING/STEWARDSHIP**


Perhaps the single most important action needed to greatly slow down the development and spread of antibiotic resistant infections is to change the way antibiotics are used. Up to half of antibiotic use in humans and much of antibiotic use in animals is unnecessary and inappropriate and makes everyone less safe. Stopping even some of the inappropriate and unnecessary use of antibiotics in people and animals would help greatly in slowing down the spread of resistant bacteria. This commitment to always use antibiotics appropriately and safely—only when they are needed to treat disease, and to choose the right antibiotics and to administer them in the right way in every case—is known as antibiotic stewardship.
- 4 DEVELOPING NEW DRUGS AND DIAGNOSTIC TESTS**


Because antibiotic resistance occurs as part of a natural process in which bacteria evolve, it can be slowed but not stopped. Therefore, we will always need new antibiotics to keep up with resistant bacteria as well as new diagnostic tests to track the development of resistance.

According to Centers for Disease Control and Prevention, *four core actions* can help fight resistance.

1. Prevent infections
2. Track infections
3. Improve prescribing (stewardship)
4. Develop new drugs and diagnostics

Infection Control

- Prevent transmission of resistant organisms



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:		



Guideline for the Management of Antimicrobial Resistant Microorganisms in Minnesota Long-Term Care Facilities

Minnesota Department of Health

Infectious Disease Prevention and Control Division

Facility and Provider Compliance Division

October 2000

Vaccination and Surveillance

- Vaccination of residents and health care workers
- Surveillance for infections, including antibiotic resistant infections

FluSafe: Vaccinating Staff, Protecting Patients - Minnesota Dept. of Health

MDH Minnesota Department of Health

HOME TOPICS ABOUT US

Flu Vaccine for HCP
 Vaccine for HCP Home
 Influenza Vaccine Administration
 Storage and Handling
 Vaccinating Healthcare Workers
 Documentation/MIC

Health Professionals Influenza Information
 For Health Professionals Home
 Testing
 Rapid Testing
 Vaccine
 Treatment and Antiviral
 Infection Control
 Reporting

Influenza (Flu)
 Flu Home
 Flu Basics
 Statistics
 For Health Professionals
 For Long-Term Care
 For Schools
 For Child Care
 For First Responders
 Printed Materials
 Prevent the Flu: Videos

FluSafe: Vaccinating Staff, Protecting Patients

FluSafe
 Vaccinating staff, protecting patients

90-100%
 80-89%
 70-79%

Participate in FluSafe Promote FluSafe

Share This

Spotlight
 Subscribe to Influenza Information for Health Professionals
 Get an email alert when there are major additions or updates of influenza information for health professionals.

FluSafe
 Vaccinating staff, protecting patients
 Health care worker flu vaccination program.

Weekly Influenza Activity
 The statistics page has information on occurrence of influenza in Minnesota.

Seasonal Influenza Information for Health Professionals
 Attention: Non-MDH link

If you have questions or comments about this page, use our [JDRPC Comment Form](#) or call (651) 201-5414 for the MDH [Infectious Disease Epidemiology, Prevention and Control Division](#).

What is FluSafe?
 Fact sheet describing the FluSafe program and its benefits.

FluSafe Facilities
 A list of Minnesota hospitals and nursing homes that vaccinated 70% or more of their health care workers.

Vaccinating health care workers
 Strategies, tools, and national toolkits to assist facilities in increasing their health care worker influenza vaccination rates.

Minnesota's FluSafe program earns prestigious national award
 FluSafe is a new Minnesota program to publicly recognize hospitals and

FluSafe Facilities - Minnesota Dept. of Health

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FluSafe Facilities

The Minnesota hospitals and nursing homes listed below have shown their commitment to protecting patient health by achieving high influenza vaccination rates in their employees.

2015-16 Influenza Season

- ▶ **What is FluSafe?**
- ▶ **FluSafe 2015-16 Results (PDF)**
 Summary of the program results.

90-100%

At least 90% of staff were vaccinated against influenza at the following facilities:

HOSPITALS (by city)	NURSING HOMES (by city)
Alexandria: Douglas County Hospital	Adams: Adams Health Care Center
Benson: Swift County-Benson Hospital	Bigfork: Bigfork Valley Communities Hospital
Blue Earth: United Hospital District	Buffalo: Park View Care Center
Canby: Sanford Canby Hospital	Canby: Sanford Canby Sylvan Court
Ely: Ely Bloomenson Community Hospital	Duluth: Bayshore Residence and Rehabilitation
Glencoe: Glencoe Regional Health Services	Fulda: Maple Lawn Nursing Home

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CMS and Stewardship

Final CMS rule changes in long-term care (including § 483.80 Infection Control)

- First comprehensive change to conditions of participation since 1991
- **November 28, 2016:** IPC program and quality assurance programs must be in place
- **November 28, 2017:** Antibiotic stewardship program must be in place
- **November 28, 2019:** Infection preventionist with specialized training in IPC must be on staff

For **November 28, 2017**, infection prevention and control program must include:

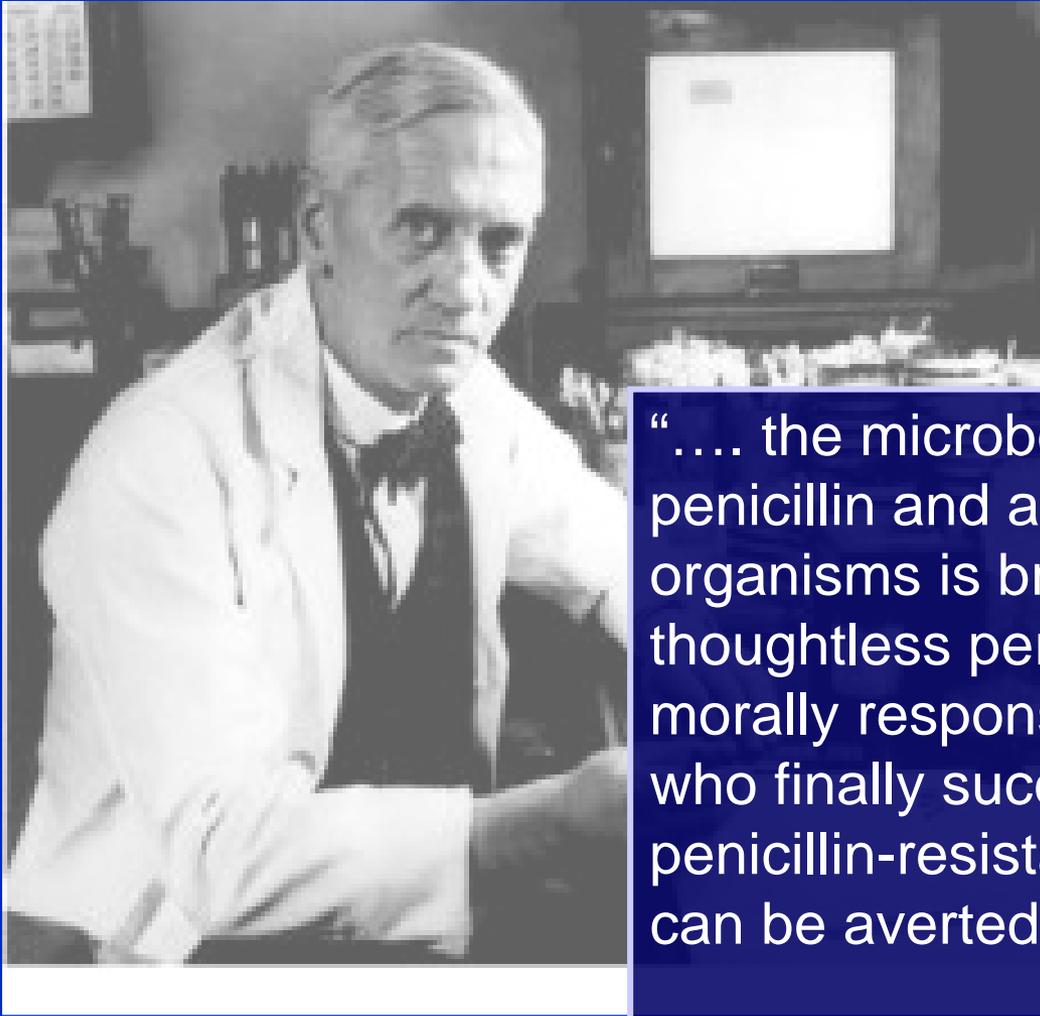
- Antibiotic use protocols
- System to monitor antibiotic use

Maintaining a Stewardship Program

“Implementing and sustaining antibiotic stewardship in nursing homes requires an **organizational commitment** and a **strategy** based on **goal setting, process and outcome measurement, and continuous quality improvement.**”

Crnich et al. Optimizing antibiotic stewardship in nursing homes. *Drugs & Aging*, 2015. 32:699–716.

Antibiotic Stewardship



“.... the microbes are educated to resist penicillin and a host of penicillin-fast organisms is bred out... In such cases the thoughtless person playing with penicillin is morally responsible for the death of the man who finally succumbs to infection with the penicillin-resistant organism. I hope this evil can be averted.”

- Sir Alexander Fleming, June 1945

Antibiotics Research Subsidies Weighed by U.S.

By Andrew Pollack Published: November 5, 2010

Margaret A. Hamburg, commissioner of the Food and Drug Administration, said at a news conference last month. The world's weakening arsenal against "superbugs" has prompted scientists to warn that **everyday infections could again become a major cause of death just as they were before the advent of penicillin around 1940.**

"For these infections, we're back to dancing around a bubbling cauldron while rubbing two chicken bones together," said Dr. Brad Spellberg, an infectious disease specialist at Harbor-U.C.L.A. Medical Center in Torrance.

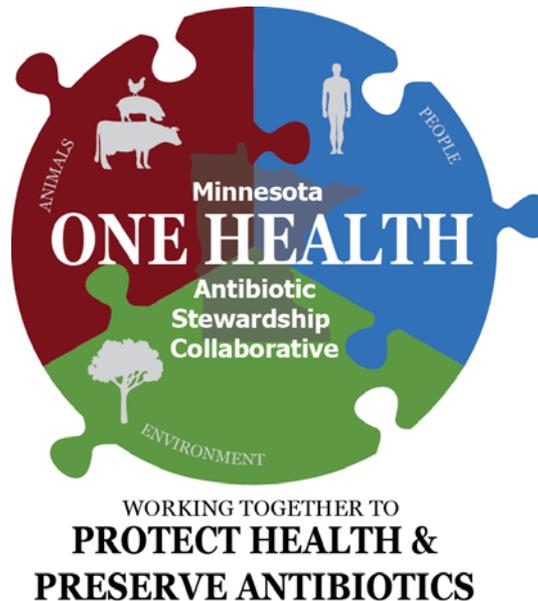
Post-Antibiotic Era



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