

# Antibiotic Stewardship in Long-Term Care Kick-Off Summit

## The CDC Core Elements for Antimicrobial Stewardship

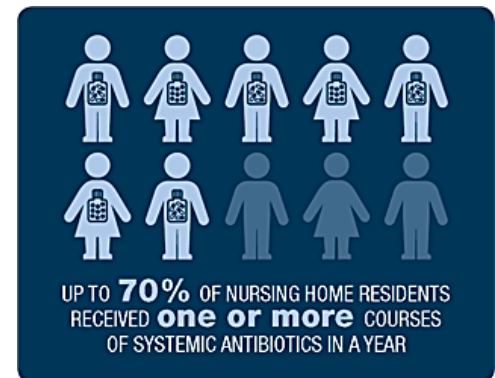
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Centers for Disease Control and Prevention



# Antibiotics are frequently prescribed in nursing homes.

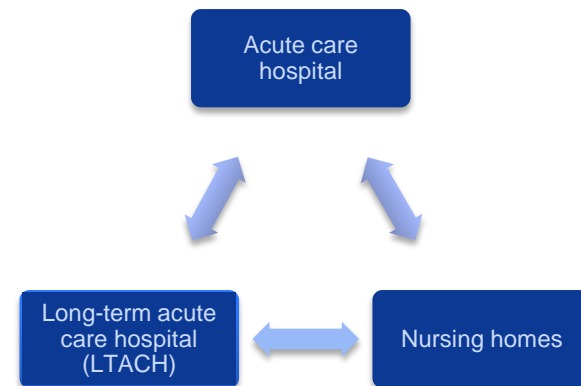
- More than three million Americans receive care or reside in ~15,600 CMS certified nursing homes (NHs).<sup>1</sup>
  - By 2060 the number of Americans  $\geq 65$  years will double.<sup>2</sup>
  - 35% of those age  $\geq 65$  years of age will receive NH care in their lifetime.<sup>3</sup>
  - NH residents have increasingly complex medical conditions.<sup>4</sup>
- An estimated 50-70% of NH residents are prescribed one or more courses of systemic antibiotics in a year.<sup>5,6</sup>
  - 40-75% of antibiotic use in NHs is inappropriate



1. [https://www.ahcancal.org/research\\_data/trends\\_statistics/Pages/Fast-Facts.aspx](https://www.ahcancal.org/research_data/trends_statistics/Pages/Fast-Facts.aspx)  
2. <http://www.prb.org/Publications/Media-Guides/2016/aging-unitedstates-fact-sheet.aspx>  
3. [https://assets.aarp.org/rgcenter/il/fs10r\\_homes.pdf](https://assets.aarp.org/rgcenter/il/fs10r_homes.pdf)  
4. [http://www.aoa.acl.gov/Aging\\_Statistics/future\\_growth/future\\_growth.aspx#age](http://www.aoa.acl.gov/Aging_Statistics/future_growth/future_growth.aspx#age)  
5. Lim et al. Clin Interv Aging. 2014 Jan 13;9:165-77.  
6. Nicolle et al. Infect Control Hosp Epidemiol. 2000 Aug;21(8):537-45

# The nursing home population are at particular risk of adverse events from antibiotics.

- Polypharmacy is associated with an increased risk of ADEs in older adults.<sup>1,2</sup>
  - Antibiotics contribute to clinically significant drug interactions.<sup>3,4</sup>
  - In a cohort study at two NHs, **13%** of ADEs were secondary to antibiotic use.<sup>1</sup>
- A cohort study of NHs in Canada showed that diarrhea, gastroenteritis and ~~*Clostridium*~~ *Clostridiodes difficile* infection were the most common antibiotic-related adverse events.<sup>5</sup>
  - Infection risk and subsequent complications, including death, are greatest in older adults.<sup>6</sup>
- Residents colonized with antibiotic-resistant bacteria spread these organisms to other residents and patients in different health care settings.<sup>6,7</sup>



1. Gurwitz et al. Am J Med. 2005 Mar;118(3):251-8.

3. Field et al, Arch Intern Med. 2001 Jul 9;161(13):1629-34.

5. Daneman et al. JAMA Intern Med. 2015 Aug;175(8):1331-1339.

7. Dumyati et al, Curr Infect Dis Rep 2017 Apr;19(4):18

2. Tamura et al, Clin Geriatr Med. 2012 May;28(2):217-36.

4. Corsonello et al, Clin Microbiol Infect. 2015 Jan;21(1):20-6.

6. Zilberberg et al. Emerg Infect Dis. 2008 Jun;14(6):929-31.

5. Furuno et al, Infect. Control Hosp. Epidemiol. 2011;32:244–249..

# Clinicians face unique challenges related to antibiotic prescribing in nursing homes.

- Decision to initiate antibiotics is frequently made offsite and influenced by family preferences and nursing staff communication.
  - Many antibiotic prescriptions (66% in one study<sup>2</sup>) are started by telephone orders without a physician examination.
- Documentation of the assessment and the decision making process is sometimes limited.
  - Key prescribing information was not documented for 38% of antibiotic courses administered.<sup>3</sup>
- High staff turnover rate
- Prescriber attitudes and practices drive antibiotic use
  - Prescribing tendencies are not driven by differences in resident characteristics or care needs<sup>4</sup>
- Lack of expertise and support

1. Crnich et al. Drugs Aging. 2015 Sep;32(9):699-716.

2. Richards et al, J Am Med Dir Assoc. 2005 Mar-Apr;6(2):109-12.

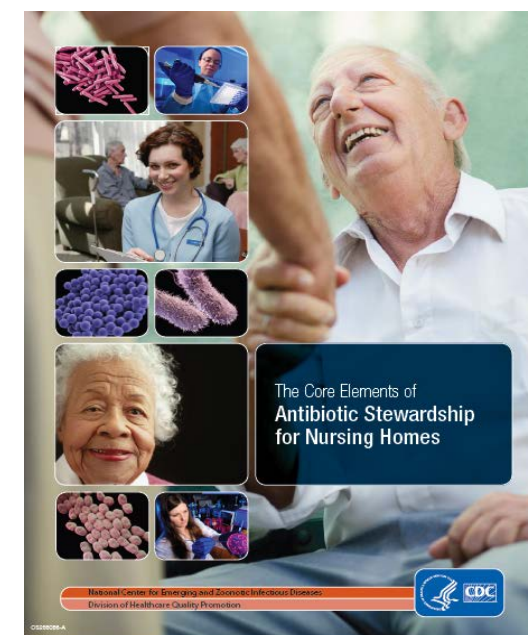
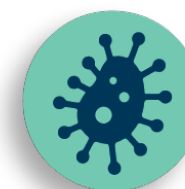
3. Thompson et al. J Am Med Dir Assoc. 2016 Dec 1;17(12):1151-1153.

4. Daneman N et al. JAMAIntMed 2013; 173:673-82

# The Core Elements of Antibiotic Stewardship for Nursing Homes.

Provide a framework for assessing current and new antibiotic stewardship activities ,  
and for monitoring and improving antibiotic use:

- Leadership Commitment
- Accountability
- Drug Expertise
- Action
- Tracking
- Reporting
- Education



# Major policy development supports antibiotic stewardship implementation in nursing homes.

- CMS issued a final rule **requiring** NHs to have antibiotic stewardship integrated within pharmacy and infection prevention and control programs (IPC).
  - Interpretive guidelines based on the Core Elements.
    - Antibiotic stewardship program that includes a system to monitor antibiotic use

DEPARTMENT OF HEALTH AND  
HUMAN SERVICES

Centers for Medicare & Medicaid  
Services

42 CFR Parts 405, 431, 447, 482, 483,  
485, 488, and 489

[CMS-3260-F]

RIN 0938-AR61

**Medicare and Medicaid Programs;  
Reform of Requirements for Long-  
Term Care Facilities**

**AGENCY:** Centers for Medicare &  
Medicaid Services (CMS), HHS.

**ACTION:** Final rule.

**SUMMARY:** This final rule will revise the requirements that Long-Term Care facilities must meet to participate in the Medicare and Medicaid programs. These changes are necessary to reflect the substantial advances that have been made over the past several years in the theory and practice of service delivery and safety. These revisions are also an integral part of our efforts to achieve broad-based improvements both in the quality of health care furnished through federal programs, and in patient safety, while at the same time reducing procedural burdens on providers.

**DATES:** *Effective date:* These regulations are effective on November 28, 2016.

# Accountability: Identifying Individuals Who Will Lead Antibiotic Stewardship Implementation.

- Accountability discusses identifying the individuals accountable for promoting and overseeing antibiotic stewardship activities.
  - Medical Director
  - Nursing Director
  - Consultant Pharmacist
- It is critical to identify a local “**champion**” who will lead stewardship implementation.<sup>1</sup>
  - The “champion” can be the IPC program coordinator. The IPC coordinator have key expertise and data to improve antibiotic use. Training, dedicated time, and resources can help IPC program coordinators support stewardship activities.



# Consultant pharmacists can play a critical role in stewardship implementation in nursing homes.

- NHs contract with long-term care pharmacies to dispense and deliver medications
  - **Consultant Pharmacist:** perform quality assurance activities and medication regimen reviews
    - Pharmacist-driven interventions have improved antibiotic prescribing in NHs.<sup>1,2</sup>
    - Engage consultant pharmacist to incorporate antibiotic use monitoring in monthly medication reviews, provide antibiotic use reports and education



1. Doernberg et al, Antimicrob Resist Infect Control. 2015 Dec 1;4:54.

2. Gugkaeva et al, Ann Long Term Care 2012;20(10);22-6.



# Nursing home antibiotic use

## Analysis of pharmacy transaction data

- Outpatient antibiotic prescribing data helped define the burden of outpatient antibiotic use, and identify opportunities for improvement
  - Geographic differences, provider groups, age groups
- Defining antibiotic use at the national and state level, analysis of proprietary aggregated prescription counts from pharmacy transaction data
  - Identify the most common classes of antibiotics prescribed, and age groups with highest prescribing rates
  - Track antibiotic use over time to measure the effect of stewardship practices and regulatory changes
  - Cannot quantify antibiotic use

MAJOR ARTICLE

US Outpatient Antibiotic Prescribing Variation According to Geography, Patient Population, and Provider Specialty in 2011

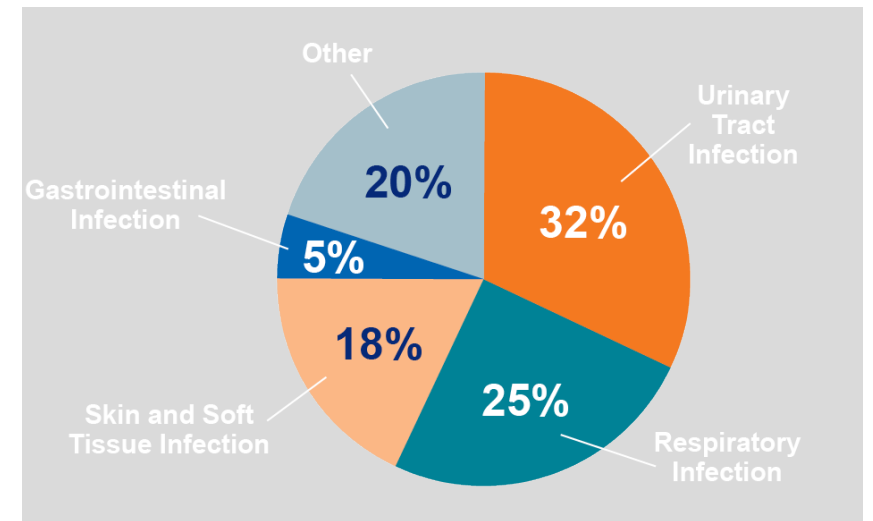
Lauri A. Hicks,<sup>1</sup> Monina G. Bartoces,<sup>1</sup> Rebecca M. Roberts,<sup>1</sup> Katie J. Suda,<sup>2</sup> Robert J. Hankler,<sup>2</sup> Thomas H. Taylor Jr.,<sup>1</sup> and Stephanie J. Schrag<sup>1</sup>

<sup>1</sup>Centers for Disease Control and Prevention, Atlanta, Georgia; <sup>2</sup>Department of Veterans Affairs, University of Illinois at Chicago; and <sup>3</sup>TMS Health, Plymouth Meeting, Pennsylvania

# Nursing home antibiotic use

## CDCs Emerging Infections Program Prevalence Survey-Pilot

- Single day survey of antibiotic use in 9 NHs<sup>1</sup>
  - **11.1%** of all residents were on an antibiotic (95% CI 9.4-12.9%)
    - Antibiotic use was more common in short-stay residents (21.2%) and residents with devices (23.5%)
    - 23% of antibiotic use was for prophylaxis



# Nursing home antibiotic use

## CDCs Emerging Infections Program Prevalence Survey

- Pilot informed a larger prevalence survey conducted in 161 NHs in 10 states 2017
  - Basic demographic and clinical characteristics
  - Use of systemic antimicrobial drugs
  - Healthcare-onset infections defined using CDC/SHEA Surveillance definitions for Infections in Long-term Care Facilities
- Objectives
  - Measure number and types of HAIs in NH residents
  - Measure number and types of systemic antimicrobial drugs used
    - Assess prescribing of drugs given for UTIs
  - Use these data to estimate burden of HAIs and antimicrobial drug use in U.S. NHs

# Nursing home antibiotic use

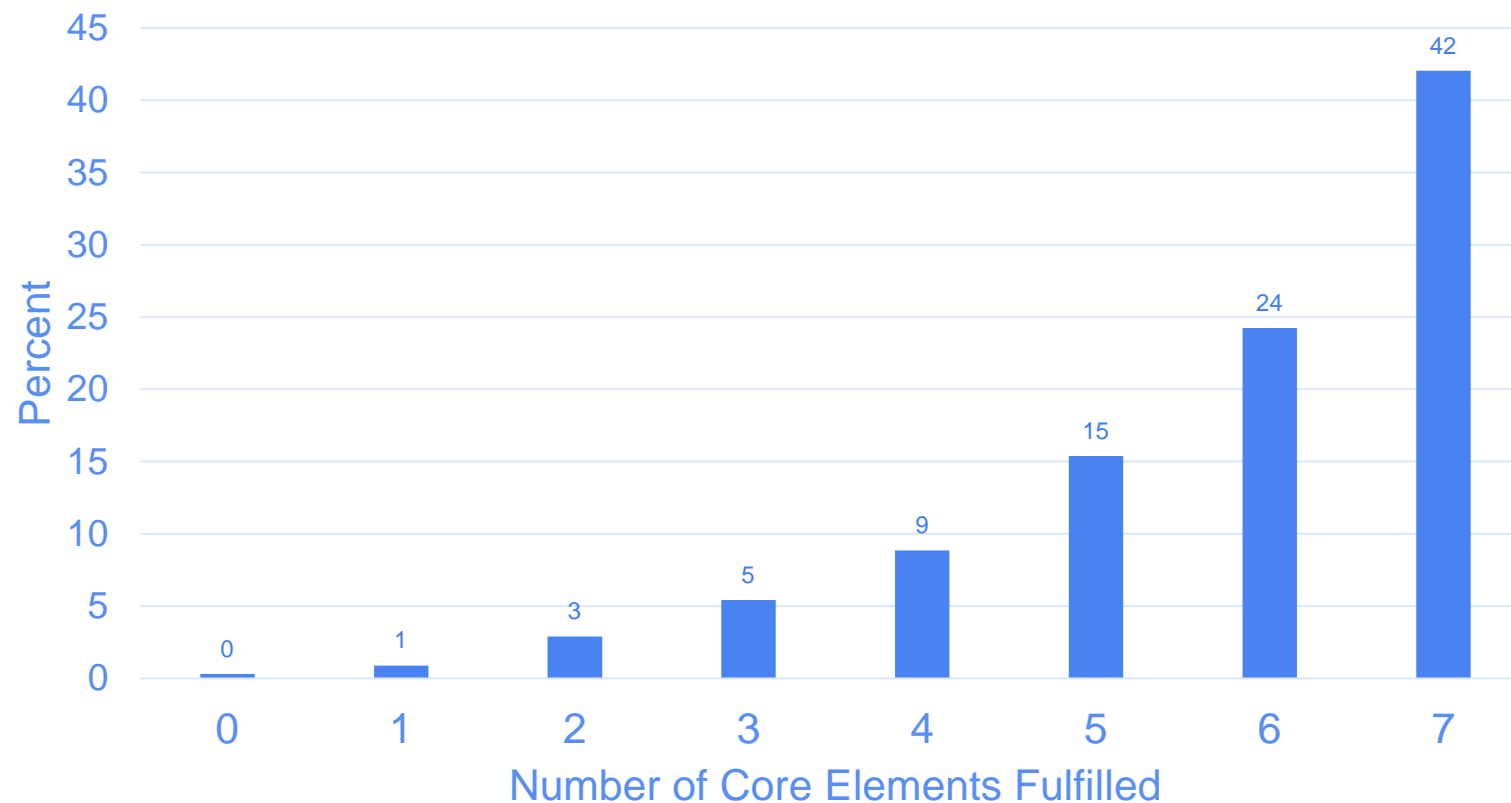
## Collaboration with Nursing Home Vendors

- Collaboration with long term care pharmacies
  - Data use agreement to share de-identified antibiotic dispensing data with PharMerica to describe antibiotic use at a facility level and explore data elements that can be used for antibiotic use reporting
- Collaboration with nursing home electronic health record companies
  - Analysis with PointClickCare to describe antibiotic use at a facility level, specifically by indication and resident characteristics in 2,600 nursing homes
  - Data use agreement to share de-identified antibiotic use data with Matrixcare to explore data elements for analysis of antibiotic use data

# Collaboration and funded work in nursing home stewardship implementation

- CDC is implementing and evaluating the *Core Elements of Antibiotic Stewardship for Nursing Homes* through Safety and Healthcare Epidemiology Prevention Research Development (SHEPheRD)
  - Tracking both antibiotic use and important clinical outcomes
- Centers for Medicare and Medicaid Services (CMS) tasked the QIN-QIOs to promote *C. difficile* infection reporting, prevention and antibiotic stewardship in nursing homes
  - >3,000 NHs (~20%) of CMS certified NHs enrolled across the country
    - >2,500 nursing home contributing to CDI data into NHSN
  - Ongoing engagement in CDI prevention and stewardship implementation activities over the coming year

# Percent of U.S. nursing homes reporting the implementation of CDC core elements on 2016 annual NHSN survey\*



\*Preliminary results courtesy of Danielle Palms, adapted from presentation at SHEA Spring Conference 2017; St. Louis, MO. Abstract 9026  
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# Educational and implementation resources

- Be Antibiotics Aware: Smart Use, Best Care resources adapted to the nursing home setting
- *Core elements of Antibiotic Stewardship for Nursing Home resources*



Core Elements for Antibiotic Stewardship in Nursing Homes

## Leading Antibiotic Stewardship in Nursing Homes

**Who are the Antibiotic Stewardship Leaders in Nursing Homes?**

- ▶ Medical Director
- ▶ Director of Nursing
- ▶ Consultant Pharmacist




## The Core Elements of Antibiotic Stewardship for Nursing Homes

### CHECKLIST



[www.cdc.gov/antibiotic-use](http://www.cdc.gov/antibiotic-use)




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 illnesses caused by viruses, like flu and most cases of bronchitis.




**What is antibiotic stewardship?**

Antibiotic stewardship refers to a set of commitments and actions designed to make sure patients receive the right dose, of the right antibiotic, for the right amount of time; and only when truly necessary. Improving antibiotic use will ensure these life-saving medications are effective and available when we need them.




**When are antibiotics necessary?**

There are times when antibiotics are urgently needed; for example, to treat sepsis (e.g., when bacteria cause a severe infection of the bloodstream), pneumonia caused by bacteria, and meningitis caused by bacteria. Using antibiotics when they are not necessary increases the risk they will not work when needed most.




**Can taking antibiotics be harmful?**

Antibiotics, like any medications, can have minor side effects like upset stomach or a rash, as well as serious allergic reactions or dangerous interactions with other medications a person is taking. In particular, antibiotics put people at risk for a deadly type of diarrhea caused by *C. difficile*. Frequent or excessive use of antibiotics leads to developing bacteria that are resistant to those antibiotics. Antibiotic-resistant bacteria are harder to kill, and can cause untreatable infections. A person also can carry resistant bacteria without feeling sick (this is called "colonization"), but if that bacteria causes an infection, it can require more complex treatments and transfer to the hospital.



**Why is improving antibiotic prescribing practices important for nursing homes?**

Nursing home residents have a higher risk of colonization with bacteria for many reasons. The presence of invasive devices such as urinary-catheters and feeding tubes, wounds, and conditions that affect the bladder (e.g., diabetes or stroke) can all lead to colonization. Difficulties in separating colonization of bacteria from true illness in frail or older adults can lead to the overuse of antibiotics, which in turn drives antibiotic resistance.



*continued on next page*

# Training on antibiotic stewardship

- CDC training on antibiotic stewardship is focused on outpatient antibiotic prescribing
  - Includes a module on NH stewardship
  - Reviews stewardship principles in the treatment of clinical conditions such as UTI that useful for NH providers
- CMS is collaboration with CDC on the development of a free on-line NH infection prevention and training course, includes a section on NH stewardship

## CDC Training on Antibiotic Stewardship: Section 1

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Blended Learning Series ID 1075730 Skill level: Intermediate

★★★★★ 4.69 (542 Ratings)

### Course Description Information

This interactive web-based activity is the first of four sections designed to help healthcare providers use to combat antibiotic resistance and improve healthcare quality and patient safety. It includes information about antibiotic resistance and threats and a detailed explanation of antibiotic stewardship. Additionally, this course will discuss risks and benefits of the microbiome, adverse drug events, and *Clostridium difficile* infections. Learn more about this course.

## Memorandum Summary

- The Centers for Medicare & Medicaid Services (CMS) and the Centers for Disease Control and Prevention (CDC) are collaborating on the development of a free on-line training course in infection prevention and control for nursing home staff in the long-term care setting.



# Antibiotic stewardship implementation can improve antibiotic prescribing in nursing homes.

- A systemic review of studies assessing antibiotic stewardship programs in NHs:<sup>1</sup>
  - Decrease in overall or indication-specific antibiotic prescribing
  - Improved “guideline adherence”
  - None reported a significant change in mortality or hospitalization.
- Studies are needed to more thoroughly evaluate outcomes such as antibiotic resistance and *C. difficile* infection specifically in nursing homes, and identify the most effective and sustainable antibiotic stewardship interventions in NHs.<sup>2</sup>

1. Feldstein et al, J Am Med Dir Assoc. 2017 Aug 7.

2. McElligott et al, Infect Dis Clin North Am. 2017 Dec;31(4):619-638.

# Thank you!

## Questions or Comments?

Email: [nfq8@cdc.gov](mailto:nfq8@cdc.gov)

For more information, contact CDC  
1-800-CDC-INFO (232-4636)  
TTY: 1-888-232-6348 [www.cdc.gov](http://www.cdc.gov)

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

**U.S. ANTIBIOTIC  
AWARENESS WEEK**  
November 12-18, 2018  
[www.cdc.gov/antibiotic-use](http://www.cdc.gov/antibiotic-use)

