Antibiotic Stewardship in Long-Term Care Kick-Off Summit
The CDC Core Elements for Antimicrobial Stewardship

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Antibiotics are frequently prescribed in nursing homes.

- More than three million Americans receive care or reside in ~15,600 CMS certified nursing homes (NHs).¹
  - By 2060 the number of Americans ≥ 65 years will double.²
  - 35% of those age ≥ 65 years of age will receive NH care in their lifetime.³
  - NH residents have increasingly complex medical conditions.⁴

- An estimated 50-70% of NH residents are prescribed one or more courses of systemic antibiotics in a year.⁵,⁶
  - 40-75% of antibiotic use in NHs is inappropriate

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³. https://assets.aarp.org/rgcenter/il/fs10r_homes.pdf
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.\(^1,2\)
  - Antibiotics contribute to clinically significant drug interactions.\(^3,4\)
  - In a cohort study at two NHs, 13% of ADEs were secondary to antibiotic use.\(^1\)

- A cohort study of NHs in Canada showed that diarrhea, gastroenteritis and \textit{Clostridium Clostridioides difficile} infection were the most common antibiotic-related adverse events.\(^5\)
  - Infection risk and subsequent complications, including death, are greatest in older adults.\(^6\)

- Residents colonized with antibiotic-resistant bacteria spread these organisms to other residents and patients in different health care settings.\(^6,7\)
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\(^2\)) 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.\(^3\)

- High staff turnover rate

- Prescriber attitudes and practices drive antibiotic use
  - Prescribing tendencies are not driven by differences in resident characteristics or care needs\(^4\)

- Lack of expertise and support

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

http://www.cdc.gov/longtermcare/prevention/antibiotic-stewardship.html
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

[Link 1](https://www.gpo.gov/fdsys/pkg/FR-2016-10-04/pdf/2016-23503.pdf)
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.¹
  - 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.¹,²
    - Engage consultant pharmacist to incorporate antibiotic use monitoring in monthly medication reviews, provide antibiotic use reports and education

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

https://gis.cdc.gov/grasp/PSA/AUMapView.html
Nursing home antibiotic use
CDCs Emerging Infections Program Prevalence Survey-Pilot

- Single day survey of antibiotic use in 9 NHs\(^1\)
  - 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

Courtesy of Nicola Thompson
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

www.cdc.gov/antibiotic-use
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 are useful for NH providers
- CMS is collaborating with CDC on the development of a free on-line NH infection prevention and training course, includes a section on NH stewardship

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:
  - 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.

Thank you!

Questions or Comments?

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