

Influencing Antimicrobial Stewardship Behavior in Nursing Homes

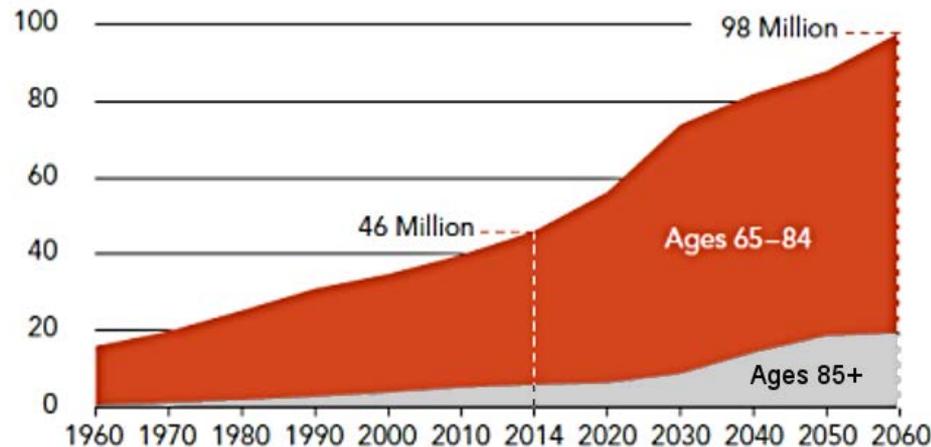
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The United States Aging Population

The Number of Americans Ages 65 and Older Will More Than Double by 2060.

U.S. Population Ages 65 and Older, 1960 to 2060 (Millions)



Population Bulletin. Aging In The United States 2015: <http://www.prb.org/pdf16/aging-us-population-bulletin.pdf>

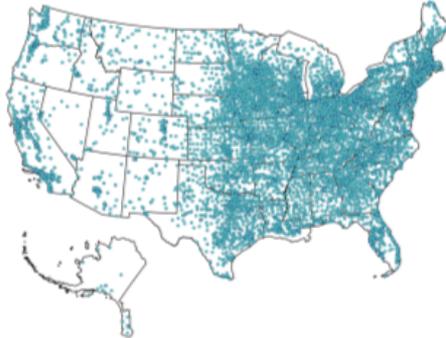
Nursing Home Care

15,655 centers

1.7 million beds

Location Breakdown ⁱⁱ

- 21%** in major cities
- 20%** in the outskirts of major cities
- 11%** in smaller cities
- 14%** in towns
- 15%** in rural areas



Individuals Served ^{iii,iv}

3.9 million

individuals for short-stay or post-acute rehabilitation and long term care

22% **SHORT stays**
(less than 100 days)

78% **LONG stays**
(100 days or more)

44%

recieve post-acute rehabilitative care

1 in 3

Americans age 65+ will receive some nursing home care in their lifetime

AHCA: https://www.ahcanal.org/research_data/trends_statistics/Pages/Fast-Facts.aspx

AARP Nursing Homes Fact Sheet: https://assets.aarp.org/rgcenter/il/fs10r_homes.pdf

Antibiotics are Overused in Nursing Homes

Commonly used

- **50-70%** of nursing home residents receive a course of antibiotic over a year, often for urinary tract infection

Often Inappropriate

- **25-75%** of antibiotic use in nursing homes may be **inappropriate or unnecessary**

Harmful

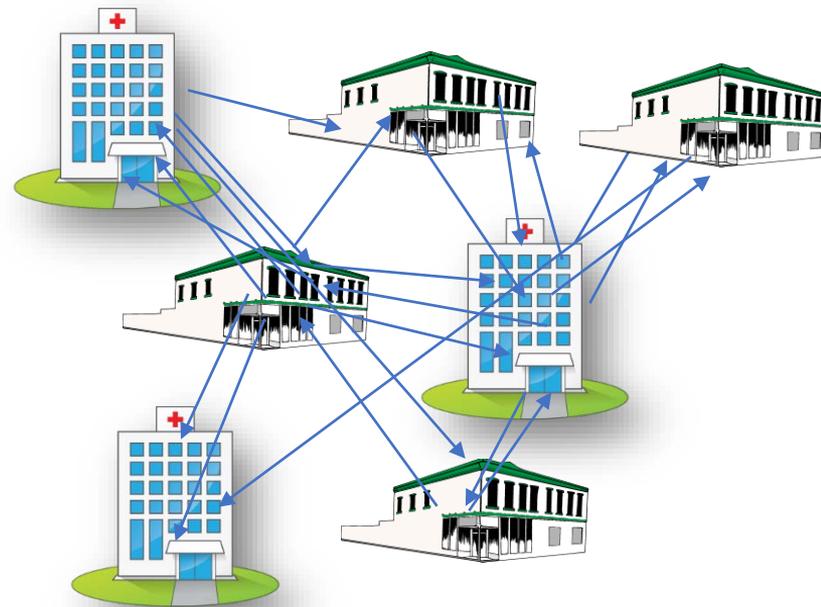
- Antibiotics are second most common drug associated with **adverse drug events**
- Lead to **antibiotic resistant bacteria**
- Lead to ***C. difficile* diarrhea**
- High use of antibiotics in a nursing home leads to antibiotic complications **among All residents** (even those not receiving antibiotics)

Lim CJ et al.. Clin Intervent Aging. 2014; 9: 165-177
Field et al. Arch Int Med 2001;161:1629-1634

Nicolle LE et al. Infect Control Hosp Epidemiol 2000; 21:537-45.
Daneman N et al. JAMA Int med 2013; 173:673-82

Nursing Homes are “Reservoirs” for Drug Resistant Bacteria

- Nursing Home Residents acquire **drug resistant bacteria** soon after admission
- **30-50% of residents** carry these drug resistant bacteria in their body
- They can transmit these bacteria to others **in and across facilities** in the region



Trick W. et al. JAGS 2001;49:270-276

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

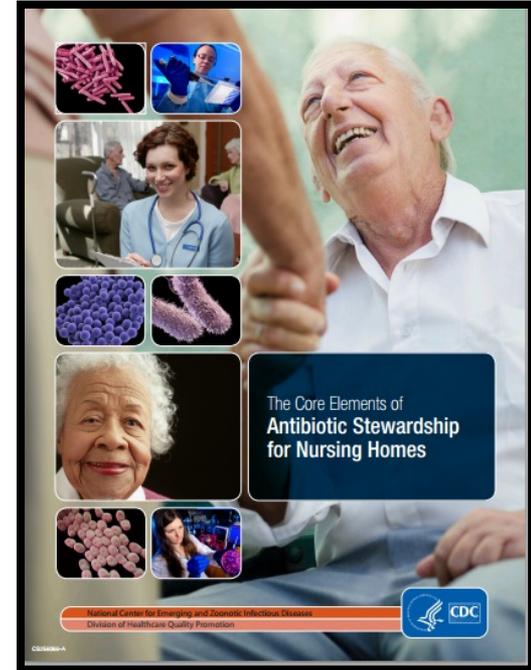
Aliyu S et al. Am J Infect Control 2017; 45:512-518

Won SY et al. Clin Infect Dis. 2011;53(6):532-40

Antibiotic Stewardship Optimizes the Use of Antibiotics

CDC Core Elements of Antibiotic Stewardship

1. Leadership support
2. Accountability
3. Drug expertise
4. Actions to improve use
5. Tracking
6. Reporting info to staff
7. Education



<http://www.cdc.gov/getsmart/healthcare/implementation/core-elements.html>



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

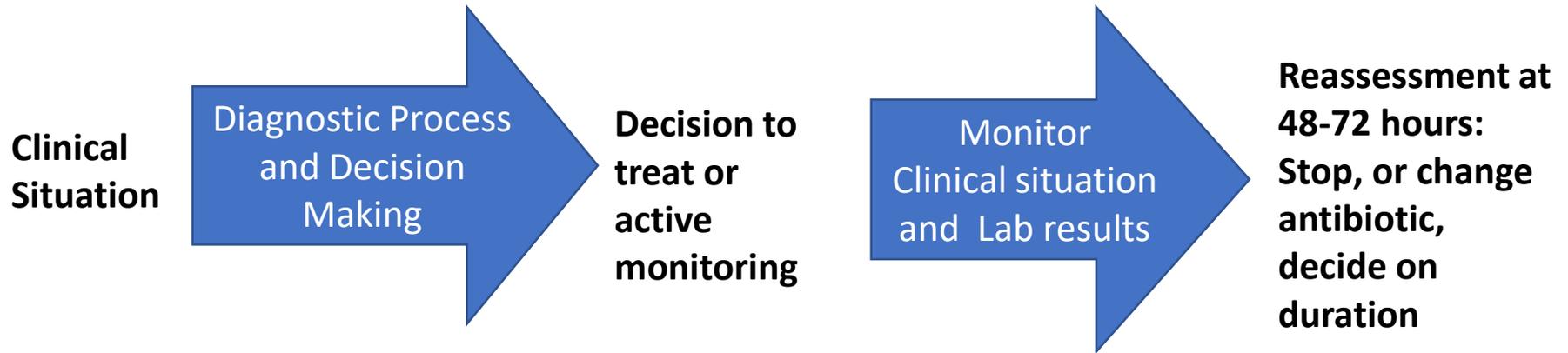
Antimicrobial Stewardship Regulation to Ensure that the Facility:

- Develops and **implements protocols** to optimize the treatment of infections
- **Reduces the risk of adverse events**, including the development of antibiotic-resistant organisms, from unnecessary or inappropriate antibiotic use; and
- Develops, promotes, and implements a facility wide system to **monitor the use of antibiotics**



<https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/GuidanceforLawsAndRegulations/Downloads/Advance-Appendix-PP-Including-Phase-2->

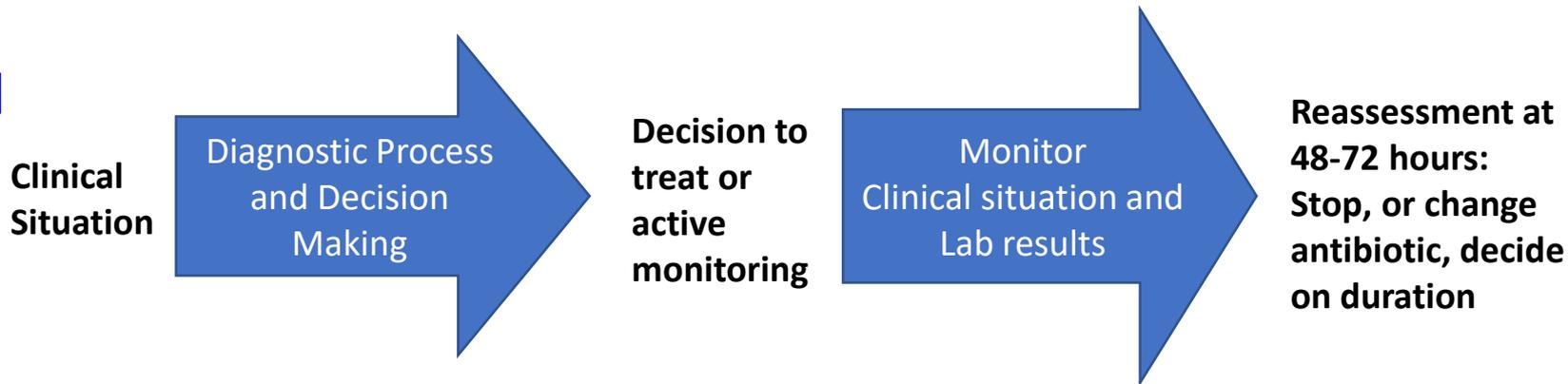
The Process of Antibiotic Prescribing Decisions



Adapted from Philip D. Sloane et al. North Carolina Medical Journal 2016;77:324-329

The Process of Antibiotic Prescribing Decisions

Ideal



Real



The Process of Antibiotic Prescribing Decisions

Real

**Clinical
Situation**

Diagnostic Process
and Decision Making

**Decision
to treat**

May occur without:

- an assessment by a nurse
- an examination by a provider
- ordering diagnostic tests
- follow-up to assess clinical response

Prescribing Decisions are Complicated by Multiple Factors

Real

**Clinical
Situation**

Diagnostic Process
and Decision Making

**Decision
to treat**

Facility and
Staff Factors

Resident and
Family Factors

Provider and
Practice Factors

May occur without:

- an assessment by a nurse
- an examination by a provider
- ordering diagnostic tests
- follow-up to assess clinical response

Adapted from Zimmerman et. al <http://www.ahrg.gov/professionals/quality-patient-safety/patient-safety-resources/resources/advances-in-hai/hai-article8.html>

Factors Leading to Diagnostic Errors and Overtreatment

Residents factors

Clinical features of infections are poor

Difficulty in obtaining a history due to cognitive, hearing and speech impairments

Colonization is common

Frail residents can deteriorate quickly

Family concerns and beliefs

System Factors

Resources to train Nursing Staff limited

Understaffed

High nursing staff turn over (47% for licensed nurses and 65% for certified nursing assistants)

Diagnostic tests less readily available

Provider Factors

Poor communications between nurses and providers

Medical provider commonly off site

Limited direct evaluation by medical staff

Orders given over the phone

Test results not available at the time of the decision

Potential Effective Strategies to Implement Antimicrobial Stewardship

Multidisciplinary Education

- Involving nurses, medical providers and families
- Improving communication
- Posters, pocket cards

Pre- and Post Prescription Data Collection

- Integrated through nurses workflow
- Incorporated through provider's workflow

External Consultants

- Infectious diseases expertise
- Pharmacists with antimicrobial stewardship expertise
- Provide feedback on prescribing

Katz MJ, et al. Clin Infect Dis 2017

Antimicrobial Stewardship Implementation Challenges and Sustainability

Address gaps in assessment of “resident change in condition”:

- Electronic medical record (EMR) with algorithm for resident’s evaluation
- Explore the use of telemedicine
- Improve turn around time for lab and radiology studies

Limited availability and functionality of EMR for tracking antibiotic use:

- Use of pre-built tracking and feedback tools for collection of antibiotic use
- Obtain data from dispensing pharmacies

Address gaps in appropriate antibiotic treatment for common infections:

- Development of medical societies evidence-based guidelines specific to the nursing home population
- EMR with clinical decision support tool for antibiotic prescribing

Limited Antimicrobial Stewardship (AS) Expertise:

- Training of consultant/in-house dispensing pharmacists and other medical staff
- Resources to increase pharmacist’s time on AS
- Resources for assistance from external experts