Process Evaluation of the Guide to Nursing Home Antimicrobial Stewardship

Elizabeth Frentzel, MPH[1]; Rikki Mangrum, MLS[1]; Tamika Cowans, MPP[1]; Mona Kilany, PhD[1]; Dia Barber[1]; Denise Mitchell[1]; Deborah Perfetto, PharmD[2]

[1]American Institutes for Research, [2]Agency for Healthcare Research and Quality

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Introduction

Antibiotics are one of the most commonly prescribed medications in nursing facilities, and **overuse of antibiotics is a serious problem**—between 25% and 75% of antibiotics prescribed in nursing homes are unnecessary (D'Agata and Mitchell 2008). **Overexposure to antibiotics allows drug-resistant strains of bacteria and health care–associated infections to emerge in the nursing facility.** When this occurs, it is harder to treat infections, and residents may develop complications. The **result is increased resident mortality, hospitalizations, and costs.**

Objectives

Funded by the Agency for Healthcare Research and Quality (AHRQ), American Institutes for Research (AIR) developed and evaluated the *Guide to Nursing Home Antimicrobial Stewardship* (the Guide) to assist nursing facilities to understand antimicrobial stewardship, start and monitor a program, and implement specific stewardship strategies**.**

Design

Evaluation methods included

- Cognitive testing interviews with facility providers, patients, and family members to test tools and components of the Guide
- Pilot test in three nursing facilities, followed by additions and refinements to the Guide
- Field test consisting of a pre-post analysis (90-day or 150-day exposure to the Guide) in nine nursing facilities
  - ◇ Semi-structured interviews with staff, as well as interim technical assistance phone calls, to assess fidelity of implementation
  - ◇ Medical chart, minimum data set (MDS), and infection control log data abstraction and analysis to assess impact on antibiotic prescribing
  - ◇ Cost analysis to assess potential savings, with consideration of antibiotic drug costs, Guide implementation costs, and cost of treatments due to adverse events

The Guide

The Guide contains six sections

1. Overview: Provides information about antimicrobial stewardship and how the Guide can help nursing homes.

2. Using the Guide: Provides guidance on choosing toolkits appropriate for a nursing home, including which tools support QAPI or state survey core elements.

3. Implement, Monitor, and Sustain an Antimicrobial Stewardship Program: The *Start an Antimicrobial Stewardship Program* toolkit provides guidance and tools for establishing a new antimicrobial stewardship program in a nursing home. The *Monitor and Sustain Stewardship* toolkit provides guidance and tools for tracking progress towards stewardship goals and providing feedback to prescribing clinicians.

4. Determine Whether It Is Necessary to Treat a Potential Infection With Antibiotics: Provides three toolkits to help to help improve evaluation of signs and symptoms, support communication with prescribing clinicians, and help clinicians use evidence-based criteria (Loeb et al. 2001, Stone, et al., 2013) developed for nursing homes. The *Suspected UTI SBAR* toolkit provides guidance and tools for suspected urinary tract infections (UTIs). The *Communication and Decisionmaking for Four Infections* toolkit provides guidance and tools for UTIs, lower respiratory infections (LRI), skin and soft tissue infections (SST), and gastrointestinal infections (GI). The *Minimum Criteria for Common Infections* toolkit provides guidance and tools for UTIs, LRI, and SST.

5. Help Prescribing Clinicians Choose the Right Antibiotic for Treating an Infection: Provides three toolkits designed to help nursing homes acquire and use an antibiogram to improve antibiotic prescribing. The *Working with a Lab* toolkit guides nursing homes in obtaining an antibiogram from their laboratory. The *Concise Antibiogram* toolkit provides guidance and tools to help a nursing home create its own antibiogram based on lab results. The *Comprehensive Antibiogram* toolkit is a complete antimicrobial stewardship program that is built around the use of an antibiogram.

6. Educate and Engage Residents and Family Members: A toolkit nursing homes can use to educate residents and their family members about what the nursing home is doing to make sure antibiotics are used properly, what the risks of taking antibiotics are, and what they can do to be engaged in decisions about their care.

The Guide is now freely accessible at: NHGUIDE.AIRPROJECTS.ORG
It will be available on AHRQ's website by the end of November, 2016.

Results

Table 1. Characteristics of nursing facilities (n=9)

Characteristics	#
Location	
Texas	4
Illinois	2
Wisconsin	1
Pennsylvania	1
Maryland	1
Ownership	
Chain	3
Independent	6
Certification	
Medicare	9
Medicaid	7
Size	
Small (<50 beds)	0
Medium (50-99 beds)	2
Large (>100 beds)	7
Nursing Home Compare Rating	
1-2 star	0
3+ star	9

Ease of using the Guide
Participants generally reacted well to the Guide and tools used. Both nursing home leadership staff and nurses reported a positive reaction to the Guide, noting the Guide's abundance of resources, ease of use, and usefulness as a good training and communication resource for nurses.

"It's very useful. Especially for new nurses, it is very organized. It says what you should say when you call the doctor, it has the facts and the background so you know what to say when you call the doctor. I have three and a half years nursing experience but in the beginning it's hard to call the doctor. For new nurses they don't know what to say and are afraid to call the doctor." - Nurse

Table 2. Characteristics of interview participants

Position	Pre-implementation Interviews	Post-implementation Interviews
Administrator	5	4
Medical Director	0	1
Director of Nursing	5	4
Assistant Director of Nursing	3	2
Nurse Managers/Supervisors	1	6
Nurse	3	19
Other	1	3

Variation in diagnosing UTIs
For UTIs, which is a common issue in long-term care and which most homes focused on, there was significant variation in identifying and diagnosing infections both among homes and within homes (see Exhibit 3). For example, many participants stated that they initiated antibiotics based on signs and symptoms, but they also stated that clinicians used urinalysis results, culture and sensitivity results, or both prior to initiating antibiotics.

Table 3. Antibiotic diagnostic procedures

Antibiotic Diagnostic Behaviors	#	1	2	3	4	5	6	7	8	9
Begin antibiotics without lab results (symptomatic)	6		◆	◆		◆	◆	◆		◆
Use SBAR or other criteria	5		◆		◆	◆		◆		◆
Careful observation if no symptoms	3				◆	◆				◆
Wait for C&S results	5	◆	◆			◆	◆	◆		
Wait for UA and C&S test results	4		◆		◆			◆		◆
Wait for UA results	5		◆		◆			◆	◆	◆
Family requests antibiotics	2		◆							◆
Routine urinalyses	1							◆		
Hospital requested urinalysis or antibiotic for UTI	2			◆			◆			
Incorrect symptoms (smelly urine, change in mental status w/o catheter)	2						◆	◆		
Use antibiotics prophylactically	1									◆

All nursing facilities selected tools to help determine whether to treat an infection (7 selected the Suspected UTI SBAR, 1 the Minimum Criteria for Common Infections, and 1 the Communicating and Decisionmaking for Four Infections). Two homes selected additional tools for monitoring progress on stewardship or educating residents or family members.

Implementation fidelity was mixed
◇ Four facilities definitely implemented their selected tools
◇ Two facilities definitely did not
◇ Ambiguous fidelity in three facilities

A couple of facilities altered the tools for efficiency. For example:
◇ Incorporated SBARs into their EHR systems to reduce paperwork and enhanced integration of information.
◇ Reduced the size of the SBAR to fit on one page to reduce faxing and paper costs.

Mixed results on stewardship practices
Half of the participants indicated that the Guide or tools had a positive impact on the antimicrobial stewardship practices within the facility. These participants stated that the use of the tools made nurses more organized, improved tracking processes for antibiotic use in nursing homes, and improved communications between nurses and clinicians.

"When this [project] started I believe we were not doing as much as we did before. Before the form started we did a lot more [initiating of antibiotics], but now people [nurses] will take a second look before thinking about asking the physician for the order." -Nurse

Key Facilitators and Challenges to Adopting and Sustaining Use of the *Guide*

Facilitators	Challenges
◇ Awareness of the importance and values of antibiotic stewardship ◇ Nursing home leaders and clinicians who establish and reinforce goals of antimicrobial stewardship regularly ◇ Ease and usability of the tools for helping nurses organize information when communicating with clinicians ◇ High quality training that includes an explanation of the context and purpose of using the tools to optimize antibiotic use ◇ Monitoring of tool use by supervisors or infection preventionists ◇ Good communication with prescribing clinicians to develop buy-in and support	◇ Nursing staff perceptions of tools as "extra paperwork" ◇ High staff turnover rates, including staff in leadership positions ◇ Adapting tools to fit with existing quality improvement efforts ◇ Challenges with delivering adequate training ◇ Lack of integration with EHRs ◇ Lack of clinician/hospital buy-in (e.g., belief in positive UA as an indicator of a UTI) ◇ Limited capacity of supervisors to carry out oversight of tool use

Results continued

Training and technical support are critical to successful implementation

Nursing facilities were initially trained either by QIN-QIO staff from TMF Health Quality Institute, or used a train-the-trainer style program and trained staff via in-services trainings. In addition, the research team sought to conduct monthly technical assistance calls.

◇ Staff turnover at nursing facilities trend higher than other fields for various reasons. Turnover at the evaluation sites affected the availability of our points of contacts for the monthly calls and to conduct additional training.

◇ A couple of facilities opted to monitor nurses use of SBARs and conducted retraining as appropriate; these nursing facilities implemented the tools more successfully.

◇ Based on the diagnostic procedures, some prescribing clinicians were unclear about appropriate criteria for initiating antibiotics

Discussion and Implications

◇ Nursing homes are aware of antimicrobial stewardship and of pending CMS rules for establishing programs in nursing homes. They are **ready for implementation** and see the *Guide* as a valuable resource for rapid adoption of stewardship strategies.

◇ **Consistent, accurate documentation of signs and symptoms is needed for** nursing homes to be able to assess progress on appropriate antibiotic use. Staff should understand why and how to use the tool, as well as how the information collected is used and reported.

◇ Nursing homes **must be able to see concrete impact from using the tools to remain committed to** stewardship. Track and report progress to staff and prescribing clinicians to improve consistency of implementation.

◇ Nursing homes will **require ongoing support and assistance** in implementing, monitoring, and sustaining stewardship and toolkits will **need regular revision and updating** to meet those needs.

Limitations

◇ Small purposive sampling size (9 homes).

◇ Different sites used different toolkits, although all used a toolkit relevant to communication and decisionmaking.

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Citations

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For more information on this project, please contact :
Elizabeth Frentzel, Principal Research Scientist, **efrentzel@air.org,** at American Institutes for Research.