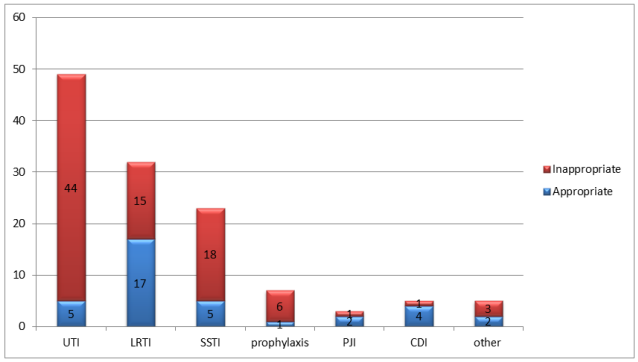
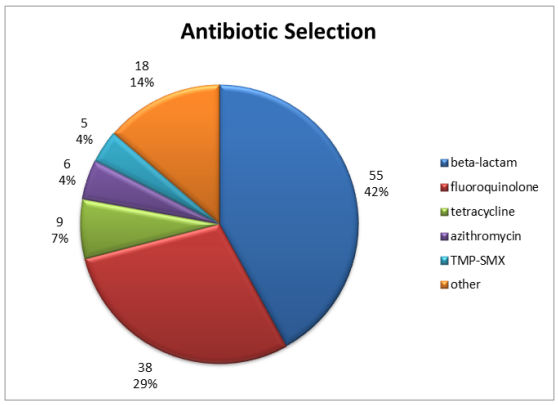
Figure 2: Proportion of Inappropriate Antibiotic Prescriptions by Indication (N=124)*



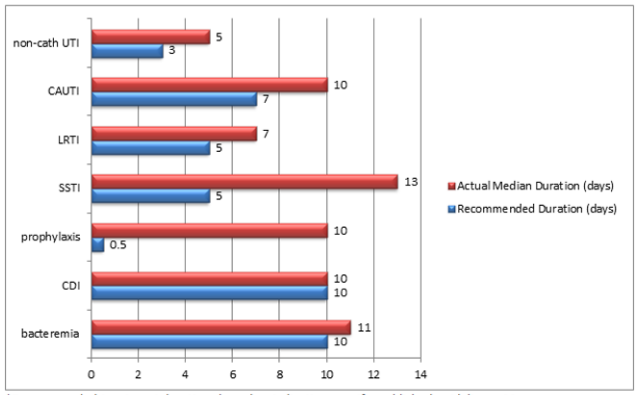
*4 courses of antibiotics were prescribed for >1 indication. UTI = urinary tract infection, LRTI = lower respiratory tract infection, SSTI = skin and soft tissue infection, prophylaxis = of any kind (UTI, dental extract, other procedural, surgical, etc), CDI = *C. difficile* infection, PJI = prosthetic joint infection, other = 2 bacteremias (appropriate), 1 complicated intra-abdominal infection (inappropriate), 1 tooth infection (inappropriate), and 1 osteomyelitis (appropriate).

Figure 3: Antibiotic Prescribing by Class or Agent (N=131)*



*11 residents given >1 antibiotic for the indication. TMP-SMX = trimethoprim-sulfamethoxazole. other = 4 vancomycin oral, 3 vancomycin IV, 3 clindamycin, 3 metronidazole, 2 daptomycin IV, 2 nitrofurantoin, and 1 aztreonam. Beta-lactams = 15 amoxicillin-clavulanate, 15 cephalexin, 7 amoxicillin, 5 ceftriaxone IM/IV, 3 cefepime IV, 3 cefdinir, 1 ampicillin IV, 1 cefadroxil, 1 cefpodoxime, 1 ampicillin-sulbactam IV, 1 cefazolin IV, 1 meropenem IV and 1 cefuroxime. Fluoroquinolones = 23 levofloxacin and 15 ciprofloxacin. Tetracyclines = 8 doxycycline and 1 minocycline.

Figure 4: Assessment of Antibiotic Treatment Duration Appropriateness by Indication (N=120)*



*Recommended treatment durations based on indication-specific published guidelines. Many treatment durations recommended are ranges and dependent on clinical response. For purposes of this analysis, *minimum* recommended durations were select for comparison to actual median durations (all indication-specific treatment duration data was non-parametric and not evenly distributed). Other infections not depicted above include: prosthetic joint infections (recommended duration 42 days matched actual median duration 42 days), complicated intra-abdominal infection (recommended duration 4-7 days surpassed by actual duration 42 days), tooth infection (recommended duration 7 days compared to actual duration 10 days), and osteomyelitis (recommended duration 42 days matched actual duration 42 days)

References:
[1]Centers for Disease Control and Prevention. Core Elements of Nursing Home Antibiotic Stewardship Programs. Atlanta, GA: US Department of Health and Human Services, CDC; 2014 http://www.cdc.gov/getsmart/healthcare/implementation/coreelements.html. Accessed 4/30/2019.
[2]Loeb M, Bentley DW, Bradley S, et al. Development of minimum criteria for the initiation of antibiotics in residents of long-term care facilities: Results of a consensus conference. Infect Control Hosp Epidemiol 2001; 22: 120-4.
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2048. Antibiogram Use in Wisconsin Nursing Homes

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Session: 237. Antibiotic Stewardship: Long-Term Care
Saturday, October 5, 2019: 12:15 PM

Background. A 2014 survey demonstrated that fewer than 10% of Wisconsin (WI) Nursing Homes (NHs) used an antibiogram. In 2016, the Centers for Medicare & Medicaid Services released regulations requiring NHs to track and report their antibiotic-related outcomes. The impact these regulations will have on the development and use of antibiograms in NHs is unknown.

Methods. To characterize antibiogram use in WI NHs, a mixed-methods approach was used consisting of two statewide surveys, a combination of semi-structured interviews with key NH personnel, and a structured survey administered to providers in a sample of facilities using an antibiogram. Answers to questions included on statewide surveys administered in 2014 and 2018 were used to assess change in antibiogram use over time. Semi-structured interviews with key NH personnel focused on antibiogram development and dissemination. Structured surveys of providers focused on their awareness of antibiogram existence and the extent to which it influenced their prescribing behavior. A copy of the antibiogram was obtained from some facilities to assess consistency with Clinical and Laboratory Standards Institute (CLSI) recommendations.

Results. Antibiogram use in WI NHs increased from 9.3% in 2014 to 32.5% in 2018. The majority of antibiograms were not facility-specific, primarily due to inadequate numbers of isolates at individual facilities. Most facilities reported that antibiogram tools were updated annually, and most made an effort to disseminate them to prescribers. However, 30% of surveyed prescribers reported being unaware of the existence of an antibiogram and only 40% reported it influenced their prescribing decisions. Review of antibiograms provided by NHs revealed that all were created using the traditional "drug-bug" format; however, none were fully compliant with CLSI recommendations.

Conclusion. Antibiogram use in WI NHs increased significantly between 2014 and 2018. The majority of antibiograms used in WI NHs are not based on facility-specific data. A substantial number of providers are unaware of the existence of an antibiogram in their facility and only a minority felt that it impacted their prescribing decisions. More research is needed on how to increase antibiogram utility in NHs.

Disclosures. **All authors:** No reported disclosures.

2049. Trends in Antibiotic Use and Antibiotic Resistance among Veterans Affairs Community Living Centers from 2011 to 2017

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Session: 237. Antibiotic Stewardship: Long-Term Care
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Background. Antibiotic resistance is a global public health crisis, with antibiotic overuse contributing to selection pressure, and thus driving antibiotic resistance. Strategies to reduce antibiotic overuse may slow the development of resistance, but large-scale studies assessing trends in antibiotic use and resistance among nursing homes at the national level are limited. We describe trends in antibiotic use and resistance nationally among Veterans Affairs (VA) Community Living Centers (CLCs).

Methods. We assessed antibiotic use and microbiological cultures among VA CLC residents from 2011 to 2017. Antibiotics were grouped into eight drug classes and annual days of antibiotic therapy per 1,000 bed-days were calculated. Facility-weighted annual antibiotic resistance rates were calculated. *Joinpoint* Software was used for regression analyses of trends over time and to estimate annual average percent changes (AAPC) with 95% confidence intervals (CI).

Results. Over 7 years and among 146 CLCs, several significant trends in decreasing antibiotic use and corresponding reductions in resistance were identified. Fluoroquinolone use decreased by 9.9% annually (95% CI −11.6 to −8.2%) and fluoroquinolone resistance decreased by 2.3% per year for *Escherichia coli,* 5.1% for *Klebsiella* spp., 1.8% for *Proteus mirabilis,* 4.9% for *Pseudomonas aeruginosa,* 12.6% for *Enterobacter* spp., and 3.2% for *Enterococcus* spp. Anti-pseudomonal penicillin use decreased by 6.6% annually (95% CI −10.6 to −2.4%) and anti-pseudomonal penicillin resistance rates decreased each year by 7.9% for *Escherichia coli*, 8.9% for *Klebsiella* spp., 15.2% *for Proteus mirabilis* and 4.2% for *Pseudomonas aeruginosa*. Anti-staphylococcal penicillin use decreased by 5.4% annually (95% CI −10.0 to −0.5%) and resistance in *Staphylococcus aureus* decreased 1.7% per year.

Conclusion. Nationally among VA CLCs, we observed significant reductions in the use of several classes of antibiotics with corresponding reductions in antibiotic resistance, including an impressive decline in fluoroquinolone use and corresponding decreases in fluoroquinolone resistance among six organisms. Future research should

assess whether reductions in antibiotic use predict later reductions in antibiotic resistance and improvements in resident outcomes.

Disclosures. **All authors:** No reported disclosures.

2050. Effect of a Stewardship Intervention on Post-Prescriptive Antibiotic Timeouts in Nursing Homes

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Session: 237. Antibiotic Stewardship: Long-Term Care
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Background. Antibiotic overuse and misuse is a common problem in nursing homes (NHs). Meaningful improvements in the quality of antibiotic prescribing in NHs may be improved through post-prescriptive interventions (antibiotic timeouts) focused on stopping, streamlining and/or shortening ongoing antibiotic treatments. A recently completed trial of a complex antibiotic stewardship intervention provided us with an opportunity to explore to what extent NH providers engaged in antibiotic timeouts at baseline and the effects of the intervention on these behaviors.

Methods. Data on antibiotic prescriptions in 11 NHs (6 intervention, 5 control) were collected for 12 months prior and 13 months after intervention introduction. We categorized antibiotic change events (ACEs) as: (1) changes in dose, frequency, or route for the same antibiotic, (2) change to another antibiotic with different spectrum, and (3) early discontinuation (stopped after 2 days or less). Modifications considered to be routine (e.g., Azithromycin dose reduction from 500 to 250 mg) were not considered a meaningful ACE. Frequency of ACEs both overall and by type were compared using a difference in difference (DID) approach.

Results. Of 2647 NH initiated antibiotic events, 376 (14.2%) were modified over the study period. The most common type of modification was a change in spectrum (n = 241, 64.1%) followed by early discontinuation of the antibiotic (n = 118, 31.4%). The difference in ACEs before and after the intervention as well as DID estimates are detailed in the Table.

Conclusion. The antibiotic stewardship intervention did not impact total ACEs but did appear to increase the frequency of discontinuation ACEs. An inability to capture data on shortening ACEs (e.g., reducing a treatment course from 14 to 7 days) was a limitation of this study. Additional research on how to foster more frequent and effective antibiotic timeouts in NHs is needed.

	PRE		PRE-Difference	p-value	POST		POST Difference	p-value	DID	p-value
	Intervention	Control			Intervention	Control				
No. of antibiotic event	764	559			724	580				
	%	%	%		%	%	%			
Event modified, n=376	0.179	0.120	0.059	0.024*	0.146	0.110	0.036	0.156	-0.024	0.409
Spectrum, n=241	0.124	0.073	0.051	0.081	0.084	0.073	0.012	0.531	-0.039	0.153
Early stop, n=118	0.045	0.043	0.002	0.922	0.057	0.031	0.027	0.019*	0.025	0.014*

* p<0.05

Disclosures. **All authors:** No reported disclosures.

2051. Frequency of Inappropriate Antibiotic Prescribing in Nursing Homes

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Session: 237. Antibiotic Stewardship: Long-Term Care
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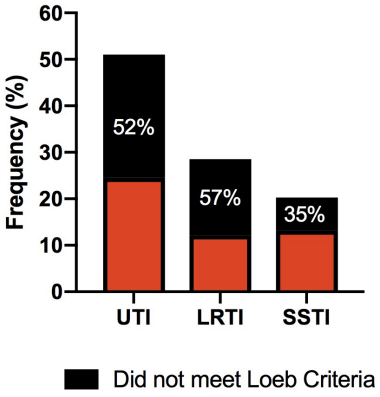
Background. Antibiotics are among the most prescribed medications in nursing homes (NHs). The increasing incidence of multidrug-resistant and *C. Difficile* infections due to antibiotic overuse has driven the requirement for NHs to establish antibiotic stewardship programs (ASPs). However, estimates of the frequency of inappropriate antibiotic prescribing in NHs have varied considerably between studies. We evaluated the frequency of inappropriate antibiotic prescribing in a multi-state sample of NHs.

Methods. We utilized a retrospective, (20%) random sample of residents of 17 for-profit NHs in Oregon, California, and Nevada who received antibiotics between January 1, 2017 and May 31, 2018. Study NHs ranged in size from 50 to 188 beds and offered services including subacute care, long-term care, ventilator care, and Alzheimer's/memory care. Data were collected from residents' electronic medical records. Antibiotic appropriateness was defined using Loeb Minimum Criteria for initiation of antibiotics for residents with indications for lower respiratory tract infection (LRTI), urinary tract infection (UTI) and skin and soft-tissue infection (SSTI). Residents with other types of infections were excluded from the study.

Results. Among 232 antibiotic prescriptions reviewed, 61% (141/232) were initiated in the NH. Of these, 65% were for female residents and 81% were for residents above the age of 65. Nearly 70% (98/141) of antibiotic prescriptions were for an indication of an LRTI, UTI, or SSTI of which 51% (57% of LRTIs, 52% of UTIs, and 35% of SSTIs) did not meet the Loeb Minimum Criteria and were determined to be inappropriate. Among antibiotics that did not meet the Loeb Minimum Criteria, more than half were cephalosporins (40%) or fluoroquinolones (14%) and the median (interquartile range) duration of therapy was 7 (5–10) days.

Conclusion. These data from a multi-state sample of NHs suggest the continued need for improvement in antibiotic prescribing practices and the importance of ASPs in NHs.



Disclosures. **All authors:** No reported disclosures.

2052. Characterizing Nursing and Provider Social Networks to Develop an Instrument to Improve Antibiotic Stewardship Efforts in Nursing Homes

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Session: 237. Antibiotic Stewardship: Long-Term Care
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Background. Inappropriate antibiotic use is a common problem in nursing homes (NHs). Antibiotic decision-making in NHs is complex. Characterizing the patterns and nature of social interactions between providers and nursing staff may offer insights into the factors influencing antibiotic decisions and opportunities to improve their quality in NHs.

Methods. Chart reviews and interviews with key informants were used to identify social interactions between nursing staff and providers associated with antibiotic prescribing decisions in three NHs. Data collection was restricted to provider-nurse exchanges following a resident change in condition recognition up to receipt of an order for an antibiotic. A survey administered to nursing staff was used to collect information on employment tenure and their perceptions about facility team climate. UCINET software was used to describe network characteristics, including density and centrality.

Results. Urinary tract infections (UTIs) accounted for nearly 40% of antibiotic events across all sites. The number of contacts between nursing staff and providers was approximately two-times greater for treated UTI events when compared with treated soft-tissue infections and were four-times as great as for treated pneumonia events. Network structures were different at each study NH with varying numbers of core team members and network density (Figure 1). Team climate survey responses across SNFs demonstrate generally positive climates (4.1 on a scale of 1 to 5, 5 reflects positive).

Conclusion. NHs have unique network structures; however, more complex social interactions associated with UTI events were common across all sites. Future studies should examine influences of different social network structures on antibiotic decision-making in NHs and whether modification of network structures or their characteristics is amenable to change.

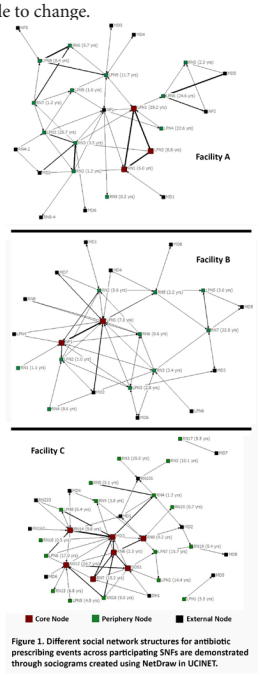

Figure 1. Different social network structures for antibiotic prescribing events across participating SNFs are demonstrated through sociograms created using NetDraw in UCINET.

Disclosures. **All authors:** No reported disclosures.