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1829. A Systems Approach to Nursing Home Antimicrobial Stewardship

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Authors

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Background. Antibiotic utilization in skilled nursing facilities (SNFs) varies widely and the factors responsible for this variation remain poorly understood. Staff retention and leadership stability in SNFs has been associated with a number of important resident and facility outcomes but the relationship to antibiotic utilization has not been examined previously. Data collected as part of an ongoing study of an antibiotic stewardship intervention in SNFs in two states provided an opportunity to explore the relationship between these facility characteristics on baseline antibiotic utilization in SNFs participating in this study.

Methods. Twelve months of pre-intervention data on antibiotic use were abstracted from pharmacy records in nine SNFs in Wisconsin and Pennsylvania. Baseline SNF characteristics were collected. The analysis focused on four clinical nursing variables: (1) director of nursing stability (1 = tenure? 5 years); (2) RN and LPN retention (1 = retention \geq median of 79.5); (3) CNA retention (1 = retention \geq median of 77.3); and full-time infection control practitioner (1 = works 50% of time or more). Measures of overall antibiotic utilization, including antibiotic starts (AS) and days of therapy (ADT) per 1,000 resident days, were calculated for each SNF over a 12-month baseline period. A GLM repeated-measures analysis explored the differences for the dichotomous variables where 1 is a Yes response.

Results. GLM analysis results shown in the table below indicate that SNFs with a full time ICP had significantly fewer ADT and fewer AS with higher RN/LPN retention. Antibiotic Starts (AS) Antibiotic Days of Therapy (ADT) DON Leadership Stability ($\mu = 0.74, P = 0.37$) ($\mu = 3.85, P = 0.66$) RN/LPN retention ($\mu = -1.53, P = 0.04$) ($\mu = -13.62, P = 0.11$) CNA retention ($\mu = -0.55, P = 0.53$) ($\mu = -11.44, P = 0.20$) Full time ICP ($\mu = -1.44, P = 0.051$) ($\mu = -15.75, P = 0.04$).

Conclusion. Our study shows that RN/LPN staff retention and having a fulltime ICP are associated with lower rates of antibiotic use in SNFs. Future studies should examine how these attributes exert influence on provider antibiotic decision-making. Nevertheless, our results suggest that ongoing efforts to improve staff retention, if successful, will positively impact the quality of antibiotic prescribing in SNFs.

Disclosures. All authors: No reported disclosures.

1828. Interrupted Time Series Analysis of a Population-Level Academic Detailing Intervention on UTIs in British Columbia's Nursing Homes

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Background. In 2016, an academic detailing (AD) intervention took place in 115 nursing homes in British Columbia. AD meetings, attended by physicians, nurses, and nursing home staff, were organized to reduce unnecessary antibiotic treatment of urinary tract infections (UTI), and in particular, asymptomatic bacteriuria. Meta-analysis of AD indicates general effectiveness for creating small prescribing changes; however, there are no large-scale evaluations of AD for nursing home antimicrobial stewardship (AMS).

Methods. UTI-linked prescriptions for nursing home residents were extracted from Pharmanet, an administrative database of prescriptions dispensed in community pharmacies. Changes in the days of supplied (DOS) prescriptions were assessed with an ecologic interrupted time series analysis. Eighty-two local health areas (LHAs) were included with 50 intervention LHAs (61%). The study period was June 2015 to March 2017 and the intervention began on July 2016. Multilevel segmented regression was used for statistical analysis.

Results. During the study period, 9,822 residents received 23,141 UTI-linked prescriptions. Intervention and control had an overall average of 101 and 15 DOS, respectively. Both intervention and control had a decreasing pre-intervention trend (average of -1.4 and -0.2 DOS per month, respectively). While the expected post-intervention rate for the intervention group was -1.1 [-1.8, -0.3] DOS per month, the observed trend was -2.8 [-2.8, -0.7] DOS per month; 169.9% lower than expected [-59.7%, 663.7%]. The control's average post-intervention trend was unchanged, -0.1 [-0.6, 0.2] DOS per month. For the intervention group, there were 4,714 [-1,921, 6,113] fewer days of UTI prescriptions in the intervention period.

Conclusion. In this pragmatic ecologic evaluation, AD was associated with reductions in UTI-coded antibiotic prescribing. The lack of large-scale AMS studies in nursing homes has hindered AMS implementation in this setting. Thus, these preliminary results address a key gap in the AMS literature. Further evaluation of this intervention with a multiple baseline design is warranted.

Figure 1. Average observed days of supply of urinary tract infection-linked prescriptions in nursing homes within intervention and control local health areas in British Columbia, June 2015 to March 2017

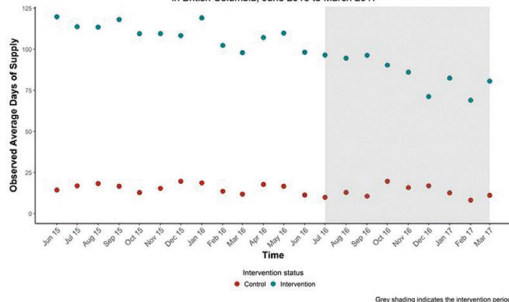
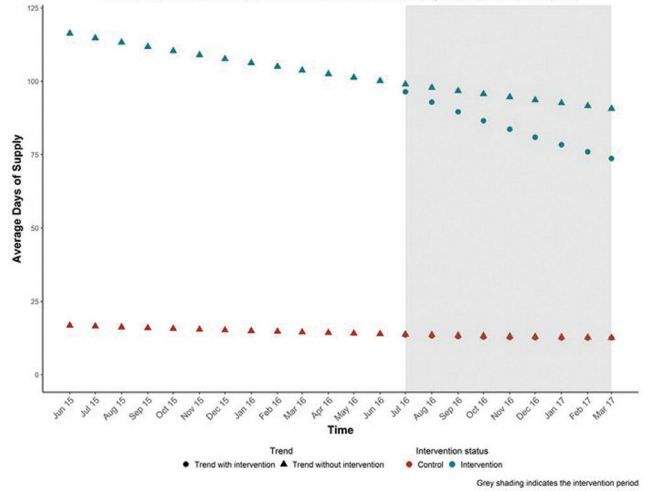


Figure 2. Average predicted days of supply of urinary tract infection-linked prescriptions in nursing homes within intervention and control local health areas in British Columbia, June 2015 to March 2017



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1829. A Systems Approach to Nursing Home Antimicrobial Stewardship

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Background. Up to 70% of nursing home (NH) residents receive one or more courses of antibiotics (ATB) annually, of which over half may be inappropriate and risk harm. The current availability of in-house NH data is often insufficient to measure and track appropriateness, due to incomplete data or unusable formatting. Our 3-year project to improve antimicrobial stewardship (AMS) used the Centers for Disease Control and Prevention's (CDC) *Core Elements of AMS for NHs*, with guided input from NH providers to develop and implement an electronic ATB de-escalation decision support tool that also captures otherwise inaccessible data.

Methods. Our baseline assessment identified wide variation in providers' knowledge, attitudes, and beliefs regarding ATB prescribing, leading us to identify de-escalation as the most feasible NH AMS intervention. Using facilitated open-ended conversations with leaders from three NH corporations, we developed an electronic decision support tool to systematically prompt de-escalation 48-72 hours post-prescribing. Subsequent site visits with NH clinical teams at a convenience sample of sites allowed us to explore how to incorporate decision support into their electronic health record (EHR).

Results. We developed a tool anchored on data capture for the "acute change in condition" that triggers prescriber interactions. It uses clinical and laboratory data to prompt structured communication between nurses and prescribers. Placing this tool in the EHR reduced duplicate charting, enabled guidance from McGeer and Loeb criteria, and promoted its adoption into practice while ensuring data capture to assess appropriateness of ATB prescribing.

Conclusion. Our electronic decision support tool captures clinical and laboratory data, which it then uses to systematically prompt conversations about de-escalation between nurses and prescribers, reducing variation in practice. Upon completion, the assessment ensures availability of data to assess, track, and report appropriate prescribing practices among prescribers. This tool proved acceptable to NH providers in three different corporations, suggesting feasibility of further expansion of this approach to a broader group of NH providers.

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1830. Avoiding Routine Urinalysis (UA) and Improving Urine Culture (UC) Utilization: An Antibiotic Stewardship Imperative in Geriatric Psychiatry and Emergency Medicine (EM)

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