Comparison of Antibiotic Use in Post-Acute and Long-Term Care Facilities Based on Proportion of Short-Stay Residents Using a Long-Term Care Pharmacy Database

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**BACKGROUND**

- The Center for Medicare and Medicaid Services (CMS) requires participating long-term care facilities (LTCF) to establish an antibiotic stewardship program (ASP)\textsuperscript{1}
- Common barriers encountered by LTCF include lack of antibiotic use (AU) data and inability to benchmark use\textsuperscript{2}
- A previous study using several national and provincial databases indicates antibiotic use (AU) among Ontario LTCF is highly variable\textsuperscript{3}
- The objective of the study was to utilize a long-term care pharmacy (LTCPh) database to obtain and compare AU data across enrolled Nebraska LTCF based on the proportion of short-stay residents

**METHODS**

- We partnered with a regional LTCPh that dispenses and reviews medication for over 40 LTCF, of which 32 agreed to participate
- Prescriptions filled by the LTCPh during the baseline year were used to calculate antibiotic starts and days of therapy (DOT)
- Starts and end dates were used to calculate DOT if available
- Manual review of administration records was performed for prescriptions with an end date <10%
- Total bed-size and proportion of short-stay beds were estimated for each LTCF based on a cross-sectional evaluation of billing records from the LTCPh and input from the pharmacists providing service to each facility
- Resident-days (RD) were obtained from each LTCF
- Starts and DOT were evaluated by grouping LTCF into 3 cohorts based on proportion of total RD attributable to short-stay residents
  - Low: <5% of total RD attributable to short-stay residents
  - Medium: 5-20% of total RD attributable to short-stay residents
  - High: >20% of total RD attributable to short-stay residents

**DISCLOSURE**

This work is supported by an investigator initiated study grant from Merck & Co. Inc.

**REFERENCES**

1. Medicare and Medicaid Programs: Reform of Requirements for Long-Term Care Facilities. 42 CFR § 483.80 2016.

**RESULTS**

- Antibiotic starts/1000 RD ranged from 3.8 to 19.4 while DOT/1000 RD ranged from 34.86 to 252.09
- Strong correlation was observed between antibiotic starts and DOT
- LTCF with >20% short-stay RD have higher antibiotic starts and DOT compared to those with <5% and 5-20% of short-stay RD
- Five LTCF with high short-stay RD are among the top 10 facilities with the highest antibiotic use compared to only 1 with low short-day RD
- Limitation: The total number of total and short-stay beds were estimated based on billing records and pharmacist input

**CONCLUSIONS**

- Long-term care pharmacy can play an important role in supporting ASP in LTCF by providing AU data for benchmarking
- Antibiotic use in LTCF is highly variable and may be influenced by the proportion of beds dedicated to short-stay residents amongst other factors

![Antibiotic Use Metrics](image)

**Antibiotic Use Metrics**

<table>
<thead>
<tr>
<th>Antibiotic Use Metric*</th>
<th>Percent Short-Stay Resident Days</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Starts/1000 resident-days</td>
<td>7.5 (5.3)</td>
<td>9.8 (3.0)</td>
</tr>
<tr>
<td>Days of therapy/1000 resident-days</td>
<td>68.5 (51.9)</td>
<td>59.0 (38.2)</td>
</tr>
</tbody>
</table>

*Data presented as mean (standard deviation)

**Correlations Between Antibiotic Use Metrics**

- Days of Therapy/1000 Resident-Days
- R² = 0.7646

**LTCF Characteristics**

- Of the 32 participating LTCF, data from 29 (91%) were included for analysis; 3 LTCF were excluded due to lack of RD data

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>All Facilities</th>
<th>Percent Short-Stay Resident-Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of facilities—n (%)</td>
<td>29 (100)</td>
<td>8 (28.6)</td>
</tr>
<tr>
<td>Total bed size—median (range)</td>
<td>66 (17-226)</td>
<td>41.5 (17-112)</td>
</tr>
<tr>
<td>Total short-stay bed—median (range)</td>
<td>4 (0.42)</td>
<td>0 (0.3)</td>
</tr>
<tr>
<td>Percent short-stay bed—median (range)</td>
<td>8.7 (0.055)</td>
<td>0 (0.0-2.9)</td>
</tr>
</tbody>
</table>

**Distribution of Antibiotic Starts and Days of Therapy Among Facilities**

- Days of Therapy/1000 Resident-Days
- Number of facilities: 32
- Days of Therapy/1000 Resident-Days: 68.5 (51.9)