

# Antibiotic Use in Pediatric Post-acute Care Facilities: A Point-prevalence Study

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## BACKGROUND

- Residents of pediatric post-acute care facilities (pPACFs) are at increased risk of infection due to multiple factors including their underlying comorbidities and reliance on invasive devices<sup>1</sup>.
- Data on antimicrobial use in pPACFs are lacking; however, in adult post-acute care facilities it is estimated that as many as 70% of residents are prescribed an antibiotic annually and 40-75% of antibiotic use is inappropriate<sup>2</sup>.
- The difficulty of diagnosing infections in adult residents is thought to contribute to inappropriate antibiotic use<sup>3</sup>; guidelines for antibiotic use have been developed for adult PACFs.
- Pediatric residents present similar diagnostic challenges as adult residents, yet antibiotic use guidelines are lacking for pPACFs.

## PURPOSE

- To assess the prevalence of antibiotic use in pPACFs on specific study dates.
- To describe potential opportunities for antimicrobial stewardship (AS) interventions.

## METHODS

### Study design, sites, and subjects

- A point prevalence study on antibiotic use was conducted on two study dates: January 20 and July 20, 2016 in nine pPACFs in the U.S.
- Eligible residents:
  - Were ≤ 21 years old
  - Resided in facility ≥ 7 days

### Data collection

- Facility characteristics: diagnostic and treatment capabilities, infection preventionist (IP), and implementation of AS program.
- Resident antimicrobial use: indication, agents received on study dates, and route of administration.

### Data analysis

- Chi-squared tests were calculated when appropriate. P values <0.05 were considered statistically significant.

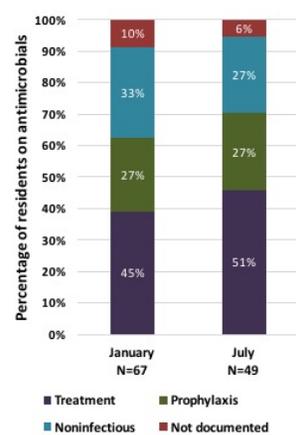
Table 1. Facility Characteristics (N = 6)

	No. (%)
Number of beds	
1-100	3 (50)
>100	3 (50)
Resources	
On-site pharmacy	4 (67)
Full time IP	3 (50)
AS program	4 (67)
Respiratory viral testing	6 (100)

Table 2. Resident Characteristics

	January No. (%)	July No. (%)
Census	666	677
Medical device use (available 5 sites)	N = 529	N=542
Feeding tube	221 (42)	208 (38)
Tracheostomy	88 (17)	69 (13)
Ventilator/BiPAP/CPAP	53 (10)	47 (9)
Intermittent urinary catheter	24 (5)	9 (2)
Central venous line	19 (4)	20 (4)

Figure 1. Indications for Antimicrobial Use



## RESULTS

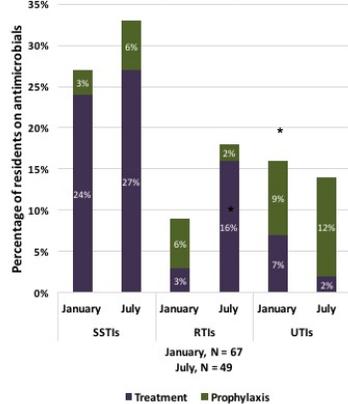
### Study sites and subjects

- To date, data have been received from 6 of 9 facilities recruited for study participation.
- Facility characteristics are outlined in **Table 1**. All facilities had access to bacterial and viral cultures, *C. difficile* testing, and respiratory pathogen PCR.
- Table 2** outlines resident characteristics.

### Antimicrobial use

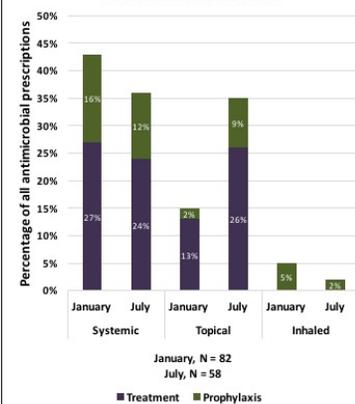
- January: 10% (67/666) of residents received 82 antimicrobial agents.
  - 72% had an infectious indication (**Figure 1**); of which 63% were for treatment and 37% were for prophylaxis.
- July: 7% (49/677) of residents received 58 antimicrobial agents.
  - 78% had an infectious indication (**Figure 1**); of which 66% were for treatment and 34% were for prophylaxis.
- Skin and soft tissue infections (SSTIs) were the most common infectious indication on both study dates (**Figure 2**).
- More antimicrobials were prescribed for respiratory tract infections (RTIs) in July than January (p = 0.01; **Figure 2**).
- Gastrointestinal dysmotility was the most common non-infectious indication (15% and 14% of residents on antimicrobials in January and July, respectively).
- For treatment of infections, the use of systemic (oral and intravenous) agents prescribed in January and July was similar (p=0.7) while topical agents were more commonly prescribed in July (p=0.06, **Figure 3**).
- 86% and 93% of systemic agents given for treatment were oral vs 14% and 7% intravenous in January and July, respectively.
- Cephalosporins were the most common systemic (oral and intravenous) agents used for treatment of infection in January (32% of systemic agents prescribed for treatment) while beta-lactams were most common in July (21%).

Figure 2. Three Most Common Infectious Indications for Antimicrobial Use



\*Treatment of RTIs, P-value = 0.01

Figure 3. Routes of Administration for Antimicrobials Used for Infectious Indications



## LIMITATIONS

- Small sample size.
- All sites had access to diagnostic modalities, such as respiratory pathogen PCR, which may not be available at all pPACFs.
- We did not review source data.

## CONCLUSIONS

- SSTIs were the most common infectious indication in contrast to data from adult long term care studies in which UTIs are the most common indication<sup>3</sup>.
- Interestingly, treatment of RTIs with antimicrobials was more common in July than in January.
- Over one-third of prescribed antimicrobials were for noninfectious indications.
- SSTI and RTI prophylaxis were common.
- These findings suggest potential AS interventions, most notably antimicrobial use guidelines.
- Future analysis will assess antimicrobial treatment duration and culture susceptibility profiles.

## BIBLIOGRAPHY

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