Table 3. Pre- and Post-Intervention Group Outcomes

	Pre-intervention n= 100 (%)*	Post intervention n = 100 (%)*	p-value
Anti-staphylococcal antibiotic use	82 (82.0)	82 (82.0)	-
Timing of anti-staphylococcal antibiotic initiation			0.55
Never started	18 (18.0)	18 (18.0)	
After blood cultures collected	64 (63.0)	69 (69.0)	
Before blood cultures collected	18 (18.0)	13 (13.0)	
Agent used			-
Vancomycin	56 (56.0)	59 (59.0)	
Daptomycin	0 (0.0)	0 (0.0)	
Linezolid	1 (1.0)	0 (0.0)	
Oxacillin	0 (0.0)	0 (0.0)	
Cefazolin	0 (0.0)	2 (2.0)	
TMP-SMX	1 (1.0)	0 (0.0)	
Doxycycline	2 (2.0)	0 (0.0)	
Multiple agents	22 (22.0)	21 (21.0)	
Ceftaroline	0 (0.0)	0 (0.0)	
None	18 (18.0)	18 (18.0)	
Antibiotic duration, median (IQ)	4.5(2,12.75)	3 (1,9)	0.39
Antibiotic duration (48 hours)			0.86
<48 hours	21 (21.0)	20 (20.0)	
>48 hours	79 (79.0)	80 (80.0)	
Antibiotic duration (72 hours)			0.17
<72 hours	26 (26.0)	35 (35.0)	
>72 hours	74 (74.0)	65 (65.0)	
Bacteremia by criteria	45 (45.0)	38 (38.0)	0.32
Bacteremia by clinical diagnosis	28 (28.0)	25 (25.0)	0.63
Bacteremia definition			0.095
Bacteremia by clinical diagnosis only	3	10	
Bacteremia by definition only	20	23	
Contaminant by both	52	52	
Length of stay, median (IQ)	8.5 (5,27)	13 (5,29)	0.39
Mortality	21 (21.0)	21 (21.0)	-

*Frequencies unless otherwise specified

91.9%, and positive PV of 55.2%. **Conclusions:** Species-level identification of CoNS positive blood cultures did not impact antibiotic utilization, diagnosis of true bacteremia, length of hospital stay, or mortality. Further studies with larger cohorts and prospective designs are needed to validate these findings and assess the long-term implications in patients.

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Organizational Readiness for Change Depends on Facility Complexity When Developing a National Stewardship Intervention

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Introduction: The organizational readiness for change assessment survey (ORCA) is a tool to assess a site's readiness for implementation and identify barriers to change. As the "Kicking CAUTI" antibiotic stewardship intervention rolled out on a national scale, we administered ORCA surveys to participating sites to capture baseline actionable information about differences among sites, to inform implementation. **Methods:** ORCA surveys were distributed by email to prescribing providers, nurses, pharmacists, infection preventionists, and quality managers at 40 participating VA Hospitals. VA hospital sites who submitted three or more surveys and their complexity level (measured as Level 1 (highest)-3) were included in the analysis. The highest complexity level facilities are those with the largest patient volume/risk, teaching and research, along with the largest number of physician specialists and contain at least five ICUs. Mean Likert scores were calculated for each of the 7 ORCA subscales on a scale of 1-5 (5 highest), and the mean of the 7 subscales was the overall ORCA score for a site. Non-parametric testing was performed comparing overall ORCA and each subscale based on complexity. **Results:** Among the participating sites, 30/40 (75%) completed at least three surveys, with a total of 202 surveys included for analysis, with 82% of surveys coming from higher complexity centers (Level 1). The highest ranked ORCA domain was the evidence subscale (measures perceived strength of evidence), mean 4.2, (SD 0.7). The lowest ranked ORCA domain across sites was resources (available to facilitate implementation), mean 3.3 (SD 0.9). Higher complexity centers had a significantly higher overall ORCA score than lower complexity centers (Level 1 or 2 vs. Level 3, p= 0.02). This difference was driven by the subscales evidence (p < 0 .01), leadership (p =0.05), measurement (p= 0.06), and resources (p=0.07) all being higher in the higher complexity facilities (Figure 1). Two of the categories (leadership and measurement) pertain to an organization's leaders ability to create an environment for change to occur as well as promoting team building. **Conclusions:** The lowest scoring ORCA domain across all sites was the respondents' perception of resources (staff, training) available for achieving change. Perceived resources were also lower in lower complexity sites, implying that medical centers of lower complexity may have higher barriers when implementing an antimicrobial stewardship intervention. This finding highlights the benefit of a national stewardship campaign that provides support to lower complexity medical centers that may not otherwise receive targeted training and support for their efforts.

Disclosure: Barbara Trautner: Stock: Abbvie–sold in December 2023; Abbott Laboratories–sold in December 2023; -Bristol Myers Squibb–sold in December 2023; Pfizer–sold in December 2023; Consultant–Phiogen–consultant. Contracted research through NIAID for STRIVE trial, currently testing Shionogi product; Contracted research–Peptilogics; Contracted research—Genentech

Figure 1. Overall ORCA and subscales between higher complexity (Level 1&2) and lower complexity (Level 3) sites

	All Sites Mean (SD)	Higher Complexity Sites Mean (SD)	Lower Complexity Sites Mean (SD)	P value*
Overall ORCA	3.71 (0.66)	**3.74 (0.65)**	**3.41 (0.67)**	**0.02**
Evidence¥	4.22 (0.67)	**4.28 (0.63)**	**3.70 (0.79)**	**<0.01**
Culture leadership§	3.68 (0.90)	3.72 (0.89)	3.35 (0.95)	0.11
Culture staff¶	3.81 (0.75)	3.83 (0.74)	3.59 (0.75)	0.17
Leadership£	3.59 (0.94)	**3.64 (0.93)**	**3.23 (0.93)**	**0.05**
MeasurementΨ	3.48 (0.90)	3.52 (0.89)	3.15 (0.92)	**0.06**
Readiness for changeΦ	3.86 (0.79)	3.87 (0.78)	3.80 (0.87)	0.952
Resources3	3.33 (0.88)	**3.37 (0.89)**	**3.05 (0.76)**	**0.07**

* P values refer to Mann Whitney U tests; bolded when significant or borderline significant
¥ Perceived strength of the evidence for the proposed change
§ Culture of leaders who reward clinical innovation and creativity, solicit opinions of clinical staff regarding decisions about patient care, and seek ways to improve patient education and increase patient participation in treatment
¶ Culture of staff who have a sense of personal responsibility, are cooperative, are willing to innovate, and are receptive to change
£ Leadership are the factors that are set out by the leader to have a successful program
Ψ Measurement are the leadership factors associated with having the information of the facility performance measures and guidelines and allow for clear goals and outcomes to be set
Φ Readiness for change refers to opinion leaders in the organization have a belief that current practices can be improved and are will to try new initiatives
3 Resources refer to the support provided financially, for training, facilities, and staffing

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Improving antibiotic use for community acquired pneumonia in hospitalized children through electronic feedback reports

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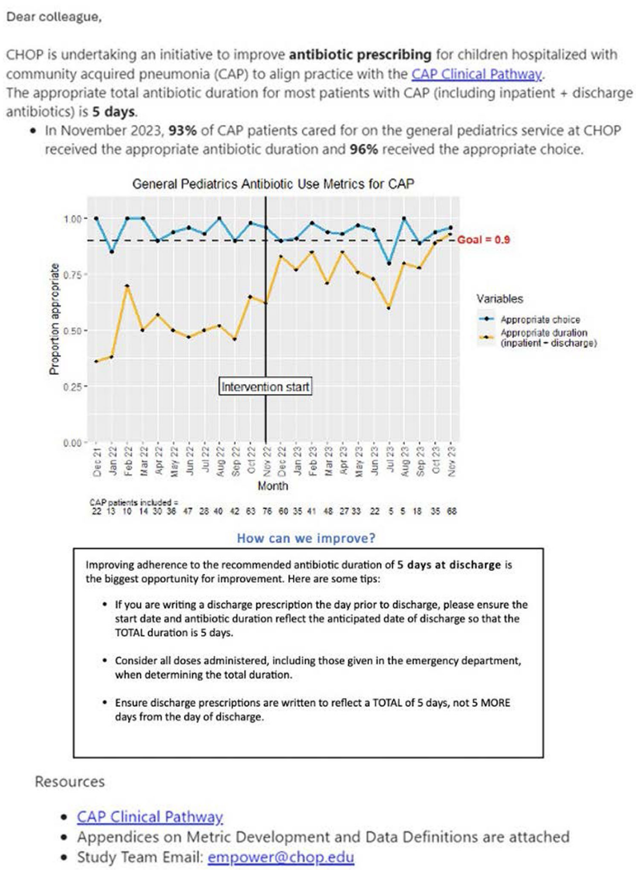
Figure 1. Example feedback report


Dear colleague,

CHOP is undertaking an initiative to improve **antibiotic prescribing** for children hospitalized with community acquired pneumonia (CAP) to align practice with the CAP Clinical Pathway.
The appropriate total antibiotic duration for most patients with CAP (including inpatient + discharge antibiotics) is **5 days**.

- In November 2023, **93%** of CAP patients cared for on the general pediatrics service at CHOP received the appropriate antibiotic duration and **96%** received the appropriate choice.

How can we improve?

Improving adherence to the recommended antibiotic duration of **5 days at discharge** is the biggest opportunity for improvement. Here are some tips:

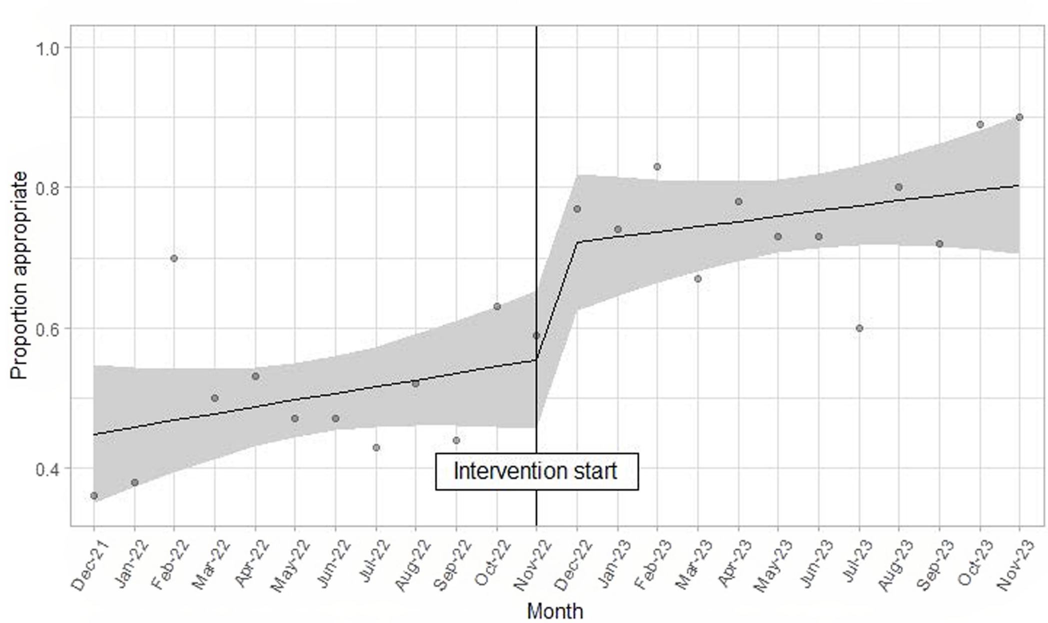
- If you are writing a discharge prescription the day prior to discharge, please ensure the start date and antibiotic duration reflect the anticipated date of discharge so that the TOTAL duration is 5 days.
- Consider all doses administered, including those given in the emergency department, when determining the total duration.
- Ensure discharge prescriptions are written to reflect a TOTAL of 5 days, not 5 MORE days from the day of discharge.

Resources

- CAP Clinical Pathway
- Appendices on Metric Development and Data Definitions are attached
- Study Team Email: empower@chop.edu

Background: Feedback reports summarizing clinician performance are effective tools to improve antibiotic stewardship in the ambulatory setting, but few studies have evaluated their effectiveness for pediatric inpatients. We developed and implemented feedback reports reflecting electronically-derived measures of appropriate antibiotic choice and duration for community acquired pneumonia (CAP) and measured their impact on appropriate antibiotic use in children hospitalized for CAP. **Methods:** We performed a single center quasi-experimental study including children 6 months to 17 years hospitalized for CAP between 12/1/2021-11/30/2023. Children with chronic medical conditions, ICU stays >48 hours, and outside transfers were excluded. The intervention occurred in 11/2022 and included clinician education, a monthly group-level feedback report disseminated by email (Figure 1), and a monthly review of clinician performance during a virtual quality improvement meeting. Patient characteristics were compared using chi-square or Wilcoxon rank sum tests. Interrupted time series analysis (ITSA) was used to measure the immediate change in the proportion of CAP encounters receiving both the appropriate antibiotic choice and duration, as well as the change in slope from the preintervention to the postintervention periods. Choice and duration were analyzed separately using ITSA as a secondary analysis. **Results:** There were 817 CAP encounters, including 420 preintervention and 397 postintervention. Patients admitted in the postintervention period were older (median age 2 years vs 3 years, P=0.03), but otherwise there were no differences in race, ethnicity, sex, ICU admission, or complicated pneumonia. Preintervention, 52% of encounters received both the appropriate antibiotic choice and duration; 96% of encounters received the appropriate antibiotic choice and 54% received the appropriate duration. The ITSA demonstrated an immediate 16% increase in the proportion of patients receiving both appropriate antibiotic choice and duration (95% confidence interval, 1-31%; P = 0.047) and no significant further increase over time following the intervention (P = 0.84) (Figure 2). When antibiotic choice was analyzed separately by ITSA, there was no immediate change or change over time in the proportion of patients receiving the appropriate antibiotic choice. In the ITSA of duration alone, there was an immediate

Figure 2. Interrupted time series analysis of overall appropriate antibiotic use (choice and duration)



Each dot indicates the proportion of encounters where both the appropriate initial antibiotic choice and antibiotic duration were administered. The solid line reflects the best fit line from the ITSA, while the gray shading reflects the 95% confidence interval.

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17% increase in the proportion receiving the appropriate duration (95% confidence interval, 2-33%; P = 0.03) and no change over time. **Conclusion:** Feedback reports generated from electronically-derived metrics of antibiotic choice and duration, combined with ongoing clinician education, increased the proportion of children with CAP treated with the appropriate antibiotic duration. Electronic feedback reports are a scalable and impactful intervention to improve antibiotic use in children hospitalized with CAP.

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Antimicrobial use among under-five hospitalized children in Bangladesh: Findings from a Point Prevalence Survey

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Background: The use of antibiotics and the occurrence of antimicrobial resistance in Bangladesh are very high. Inappropriate use of antibiotics among hospitalized children has contributed to a high rise in antimicrobial resistance in Bangladesh. Data on the rational use of antibiotics in Bangladeshi hospitals are limited. This study documented current antimicrobial usage among children under five in selected tertiary hospitals in Bangladesh. **Methods:** From August to September 2022, we conducted a point prevalence survey in four tertiary hospitals in Bangladesh. We used the World Health Organization's Point Prevalence Survey (PPS) methods and guidelines to conduct the study. Study participants were hospitalized under the age of five years children, and we collected information from the pediatric and neonatal wards of each hospital. Antibiotic-suggesting shapes were analyzed according to WHO AWaRe metrics and Anatomical Therapeutic Chemical (ATC) Classification. **Results:** The assessment included 189 children under the age of five, with the majority (78.8%, 149/189) being under one year children. Approximately three-fourths (75.1%) of children had peripheral vascular catheters following admission. Overall, 86.2% (163/189) of children were given antibiotics after being admitted to the hospital, with infants receiving the most (81.0%, 132/163). The majority of antibiotics were administered by parents (84.7%). Antibiotics from the Watch Group were most commonly prescribed (73.0%, 119/163), followed by a combination of the Watch and Access Groups (23.3%) to treat the children. Ceftriaxone (63.8%), Meropenem (16.0%), and Ceftazidime/Amikacin (8.0%) were the most regularly prescribed antibiotics. Young children (< 1 year) were more likely to get antibiotics (AOR: 3.54, p-value: 0.003) than the other children under the age of five. **Conclusion:** The data showed that most children received empirical antibiotics during hospitalization, and overuse of broad-spectrum Watch group antibiotics was common practice in hospital settings. Developing and implementing antibiotic use guidelines is critical to limit the inappropriate use of antibiotics for young children

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Greenhouse Gas Emissions Due to Unnecessary Antibiotic Prescriptions for Respiratory Diagnoses

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Background: Healthcare accounts for 8.5% of total US greenhouse gas emissions (GHGE), with US healthcare the main contributor. Yet little effort has been made to measure healthcare related GHGE. Specifically, GHGE related to unnecessary antibiotic prescriptions is unclear, and to our knowledge, no one has used estimates of GHGE of unnecessary antibiotics as an antibiotic stewardship tool. We aimed to measure GHGE from solid waste associated with unnecessary antibiotic prescriptions for respiratory conditions. **Methods:** We calculated emissions for an outpatient prescription including the plastic bottle, paper leaflet, and paper bag (photos) based on the weight of each item multiplied by US Environmental Protection Agency (EPA) GHGE factors. Emission factors depend on waste type and treatment method which we assumed to be landfilled. To estimate unnecessary antibiotic prescriptions for respiratory infections, visits from nine University of Utah Health Urgent Care Centers from 2019-2022 were electronically identified and included if they had an ICD-10-CM code for a respiratory diagnosis where antibiotics are not indicated. Waste emissions of the paper and plastic in an individual prescription were then multiplied by the number of unnecessary respiratory antibiotic prescriptions for designated time periods to arrive at total landfilled waste emissions. We used similar methods applied to published 2014 data from CDC to estimate national waste emissions due to unnecessary antibiotic prescriptions for respiratory infections. Finally, we used the EPA's GHG Equivalencies Calculator to convert emissions into tangible GHGE for providers and patients. **Results:** A prescription has 32g of paper and 15g of plastic waste. Among 124,461 urgent care visits (Table 1) in 2019-2022, 18,531 (14.9%) received an antibiotic. This equates to 593 kg of paper waste and 278 kg of plastic waste leading to a total landfilled waste emissions of 0.479 MT CO2e/ton. Using the EPA GHG Equivalencies Calculator, this equates to driving an average gasoline-powered car 1,228 miles. There were 14,482,976 unnecessary antibiotic prescriptions (Table 2) in the US for respiratory infections in 2014. Our estimates suggest these prescriptions led to 375.109 CO2e/ton of GHGE, the same as driving 961,610 miles by an