



ELSEVIER

Contents lists available at ScienceDirect

## American Journal of Infection Control

journal homepage: [www.ajicjournal.org](http://www.ajicjournal.org)

## Major Article

## Working at the intersection of context, culture, and technology: Provider perspectives on antimicrobial stewardship in the emergency department using electronic health record clinical decision support

Phillip Chung MSSW <sup>a,\*</sup>, Jean Scandlyn PhD, MSN <sup>a</sup>, Peter S. Dayan MD, MSc <sup>b</sup>, Rakesh D. Mistry MD, MS <sup>c</sup>

<sup>a</sup> Departments of Health and Behavioral Sciences and Anthropology, University of Colorado Denver, Denver, CO

<sup>b</sup> Department of Pediatrics, Division of Pediatric Emergency Medicine, Columbia University College of Physicians and Surgeons, New York, NY

<sup>c</sup> Department of Pediatrics and Emergency Medicine, Section of Emergency Medicine, University of Colorado School of Medicine, Aurora, CO

## Key Words:

Antibiotic stewardship  
Emergency department  
Electronic health record clinical decision support  
Prescribing culture

**Background:** Antibiotic stewardship programs (ASPs) have not been fully developed for the emergency department (ED), in part the result of the barriers characteristic of this setting. Electronic health record-based clinical decision support (EHR CDS) represents a promising strategy to implement ASPs in the ED. We aimed to determine the cultural beliefs and structural barriers and facilitators to implementation of antimicrobial stewardship in the pediatric ED using EHR CDS.

**Methods:** Interviews and focus groups were conducted with hospital and ED leadership, attending ED physicians, nurse practitioners, physician assistants, and residents at a single health system in Colorado. We reviewed and coded the data using constant comparative analysis and framework analysis until a final set of themes emerged.

**Results:** Two dominant perceptions shaped providers' perspectives on ASPs in the ED and EHR CDS: (1) maintaining workflow efficiency and (2) constrained decision-making autonomy. Clinicians identified structural barriers to ASPs, such as pace of the ED, and various beliefs that shaped patterns of practice, including accommodating the prescribing decisions of other providers and managing parental expectations. Recommendations to enhance uptake focused on designing a simple yet flexible user interface, providing clinicians with performance data, and on-boarding clinicians to enhance buy-in.

**Conclusions:** Developing a successful ED-based ASP using EHR CDS should attend to technologic needs, the institutional context, and the cultural beliefs of practice associated with providers' antibiotic prescribing.

© 2017 Association for Professionals in Infection Control and Epidemiology, Inc. Published by Elsevier Inc. All rights reserved.

## BACKGROUND

Antimicrobial resistance is among the most important emerging threats to effective clinical care and public health. Over 2 million patients are infected with resistant organisms each year, with an associated 23,000 deaths.<sup>1,2</sup> Indiscriminate antibiotic prescribing by clinical providers, including those in the emergency department (ED), has contributed to the emergence of antibiotic-resistant organ-

isms. Among health care providers, ED specialists have among the highest rates of antibiotic prescribing.<sup>3,4</sup> Of the 10 million outpatient antibiotic prescriptions written from the ED, >30% are inappropriate or unnecessary.<sup>3,5</sup>

Antimicrobial stewardship programs (ASPs) optimize antibiotic use and minimize antimicrobial resistance.<sup>6</sup> Although ASPs have demonstrated success for in-hospital infections, targeted ASPs for the ED have yet to be developed, a result of the unique barriers characteristic of this setting, including high patient volumes, numerous providers, and an erratic clinical workflow.<sup>7,8</sup> In fact, among major children's hospitals with ASPs, only 8% involved ED physicians in their ASP committees, and no hospitals monitored or intervened on ED antibiotic prescribing.<sup>9</sup> Postulated methods for ED-based ASP intervention include use of ED pharmacists, who can perform postprescription review or culture follow-up; however, this method is costly and not feasible in many institutions.<sup>10</sup> A more promising strategy to implement ASPs into the ED setting is through electronic

\* Address correspondence to Phillip Chung, MSSW, Department of Health and Behavioral Sciences, University of Colorado Denver, Campus Box 188, PO Box 173364, Denver, CO 80217-3364.

E-mail address: [Phillip.Chung@ucdenver.edu](mailto:Phillip.Chung@ucdenver.edu) (P. Chung).

Funding/support: Supported by the Emergency Medicine Foundation and the Clinical and Operational, Effectiveness and Patient Safety Grant Program, University of Colorado School of Medicine.

Conflicts of interest: None to report.

health record–based clinical decision support (EHR CDS).<sup>9</sup> EHR CDS uses an efficient approach that can deliver ASP recommendations at the point-of-care through the existing medical record systems, while potentially overcoming barriers present in the ED.<sup>11–13</sup> Among ED medical directors and ASP leaders, EHR CDS is the preferred method for institution of ASPs into the ED setting.<sup>9</sup>

However, an EHR CDS system that solely attends to technological implementation and fails to take into consideration the structural barriers and cultural beliefs that drive antibiotic decision-making may be less effective and sustainable. Ideally, the social and technical contexts should be assessed prior to design and implementation of EHR CDS to identify barriers and key facilitators for adoption of the technology. This provides an opportunity for clinicians to articulate their concerns and needs while eliciting their support.<sup>14,15</sup> Accordingly, the objective of this study was to determine the cultural beliefs and structural barriers and facilitators of antimicrobial stewardship in the pediatric ED using EHR CDS.

## METHODS

Given the complexity of the ED setting and the nuances required to examine the cultural beliefs and structural factors that influence antimicrobial stewardship using an EHR CDS, we used qualitative research methodology. Qualitative methods are uniquely suited to examine complex phenomena and uncover knowledge and perspectives that are otherwise unexplored or overlooked.<sup>16</sup> We conducted stakeholder interviews and focus groups with a diverse array of pediatric ED providers and administrators to attain in-depth information about provider's experience with antimicrobial prescribing practices and stewardship and the use of an EHR CDS in the pediatric ED.

### Setting and sample

We conducted the study within the Children's Hospital Colorado (CHCO) Health System. The CHCO Health System consists of EDs and the network-of-care (NOC). The main ED and satellite EDs at CHCO are a tertiary care referral center that receives approximately 93,000 visits annually, and are staffed by pediatric emergency medicine physicians, nurse practitioners, and physician assistants. The NOC consists of 4 urgent cares in the Denver metropolitan area, with a combined annual volume of approximately 85,000 visits. NOC sites are staffed by general pediatricians, nurse practitioners, and physician assistants. There is considerable overlap among the CHCO EDs and NOC because most providers attend in multiple sites. Most patients seen across all sites present for conditions related to fever, upper respiratory infection, gastrointestinal complaints, minor trauma, and acute asthma exacerbations. In addition, sites in the health system are linked using a single electronic health record (Epic; Epic Systems Corp, Verona, WI) and use common medical records, antibiotic ordering procedures, and guidelines for clinical care. In all sites, outpatient antibiotic prescribing is conducted at the end of the ED visit, typically using discharge order sets, which provide a variety of antibiotic options. Choice of antibiotic therapy is not restricted, and clinicians may elect to prescribe outside the order sets, without stopping rules. Therefore, the CHCO Health System provides a unique setting that permits assessment of a representative variety of providers and patients that would potentially benefit from antibiotic stewardship implementation in acute care outpatient settings.

We used purposive sampling to obtain a characteristic sample of participants who could provide varying perspectives of antimicrobial stewardship and EHR CDS in the pediatric ED and urgent care sites. We conducted interviews with hospital and ED leadership, and focus groups with a combination of attending faculty in pediatric emergency medicine and general pediatrics, nurse practitioners, physician

assistants, and resident trainees. Participants were recruited via e-mail. We obtained informed, verbal consent from all participants. On completion of the interview or focus group, we provided participants with a \$10 gift card. Approval for this study was granted by the Organizational Research Risk and Quality Improvement Review Panel under agreement with the Colorado Multi-Institutional Review Board.

### Data collection protocol

We developed structured question guides for interviews and focus groups to elicit a range of information on antimicrobial stewardship and clinical decision support in the ED. The guide was developed from sociotechnical models of designing and implementing health information technology in complex adaptive settings, in addition to the study team's clinical experiences.<sup>14,15</sup> The guide was organized around 3 domains: (1) factors that influence antibiotic prescribing practices in the ED; (2) providers' experiences with EHR CDS; and (3) barriers and facilitators to implementing antibiotic stewardship in the ED using EHR CDS.

One investigator with expertise in qualitative methodology moderated interviews and focus groups, whereas a second investigator took field notes. We used a semi-structured, open-ended approach that allowed the moderator to ask follow-up questions, enabled participants to explore issues outside of the question guide, and in the case of focus groups, allowed the moderator to interact with participants as a means to comment on others' experiences.<sup>17</sup> We continued data collection until no new themes emerged and data saturation was achieved. All interviews and focus groups were conducted from December 2015–February 2016 and were digitally recorded and professionally transcribed.

### Data analysis

Two investigators reviewed and independently coded the interview transcripts using QSR NVivo 11.0 (QSR International, Doncaster, Victoria, Australia). The investigators developed a coding structure using a combination of constant comparison analysis and framework analysis.<sup>18,19</sup> The process of coding included familiarization with the data, developing and applying an analytic framework, charting data into the framework, and interpretation. Data were iteratively reviewed, coded, and discussed among the researchers until a final set of themes emerged. To further ensure the quality of the analysis, we looked for negative cases, or alternative explanations for the themes, and applied the Consolidated Criteria for Reporting Qualitative Research, an empirically based 32-item checklist for comprehensively reporting on qualitative studies.<sup>16,20</sup>

## RESULTS

A total of 22 individuals participated in a stakeholder interview (n = 5) or 1 of 3 focus groups (n = 17) (Table 1).

Data analysis yielded 66 codes that were grouped into a set of themes. We subsequently organized the themes under 3 domains: (1) beliefs concerning ED antibiotic prescribing practices and the use of EHR CDS; (2) barriers to antimicrobial stewardship in the ED; and (3) facilitators to support the implementation of an ASP in the ED using EHR CDS. Themes are summarized in Table 2 and subsequently discussed. We selected direct quotations from interviews and focus groups that expressed the main themes.

### Beliefs concerning ED antimicrobial stewardship and the use of EHR CDS

Participants identified 2 overarching beliefs related to work efficiency and maintaining decision-making autonomy that framed

Download English Version:

<https://daneshyari.com/en/article/8567173>

Download Persian Version:

<https://daneshyari.com/article/8567173>

[Daneshyari.com](https://daneshyari.com)