Development of a Skills-Based IPC Supervisor Course During the 2018-19 DRC Ebola Virus Disease Outbreak

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Background: With >3,000 cases and 2,000 deaths, the current outbreak of Ebola virus disease (EVD) in the Democratic Republic of the Congo (DRC) is the second-largest reported EVD outbreak in history. Healthcare-associated transmission of EVD has been a persistent amplifier of transmission due, in part, to fragility of the healthcare system, lack of basic infection prevention and control (IPC) infrastructure, and large number of healthcare facilities (HCFs). A central component of the strategy to rapidly strengthen IPC in HCFs is the provision of IPC supervisors to oversee standardized risk assessments and improvements and provide mentorship to HCF staff. To support these activities, we designed skills based training for IPC supervisors. **Methods:** Staff recruited by the Ministry of Health (MoH) to strengthen IPC are part of an outbreak-specific cadre known as IPC supervisors. IPC supervisors, who originally lacked technical knowledge and mentoring experience, were trained to provide technical support and mentorship to staff at HCFs, with the objective of improving IPC-related processes and behaviors. A competency-based training course was designed by conducting informal assessments of IPC supervisors during daily tasks to identify areas for performance improvement. We developed competencies based on activities designated for IPC supervisors according to MoH guidelines. We planned an iterative training rollout to allow for continuous, real-time modifications based on lessons learned throughout the implementation phase. **Results:** Although IPC supervisors displayed technical knowledge of IPC recommendations, we observed large gaps in implementation. IPC supervisors frequently failed to recognize behaviors that are high-risk for infection transmission. In addition, IPC supervisors lacked the ability to develop prioritized action plans and to implement interventions aimed at rapidly improving IPC practices. The course, designed as an interactive, skills-based training, is rooted in instructional design principles and addresses 4 key competencies: risk recognition and prioritization, IPC assessment completion, action plan development, and effective leadership and communication. The course will be pilot tested in the DRC to an audience of 25 IPC supervisors. **Conclusions:** In an outbreak setting, strong mentorship and problem-solving skills are needed to support effective implementation of IPC quality improvement. Trainings that are informed by field experiences and teach problem-solving, coaching, and communication skills are critical and can be developed rapidly. The strategy employed by the Ministry of Health to rapidly achieve IPC capacitation at HCFs might be adapted for use in future outbreaks.

Development of an Electronic Algorithm to Identify Inappropriate Antibiotic Prescribing for Pediatric Pharyngitis

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Background: Antibiotic overuse contributes to antibiotic resistance and unnecessary adverse drug effects. Antibiotic stewardship interventions have primarily focused on acute-care settings. Most antibiotic use, however, occurs in outpatients with acute respiratory tract infections such as pharyngitis. The electronic health record (EHR) might provide an effective and efficient tool for outpatient antibiotic stewardship. We aimed to develop and validate an electronic algorithm to identify inappropriate antibiotic use for pediatric outpatients with pharyngitis. **Methods:** This study was conducted within the Children's Hospital of Philadelphia (CHOP) Care Network, including 31 pediatric primary care practices and 3 urgent care centers with a shared EHR serving >250,000 children. We used *International Classification of Diseases, Tenth Revision* (ICD-10) codes to identify encounters for pharyngitis at any CHOP practice from March 15, 2017, to March 14, 2018, excluding those with concurrent infections (eg, otitis media, sinusitis), immunocompromising conditions, or other comorbidities that might influence the need for antibiotics. We randomly selected 450 features for detailed chart abstraction assessing patient demographics as well as practice and prescriber characteristics. Appropriateness of antibiotic use based on chart review served as the gold standard for evaluating the electronic algorithm. Criteria for appropriate use included streptococcal testing, use of penicillin or amoxicillin (absent β-lactam allergy), and a 10-day duration of therapy. **Results:** In 450 patients, the median age was 8.4 years (IQR, 5.5–9.0)

and 54% were women. On chart review, 149 patients (33%) received an antibiotic, of whom 126 had a positive rapid strep result. Thus, based on chart review, 23 subjects (5%) diagnosed with pharyngitis received antibiotics inappropriately. Amoxicillin or penicillin was prescribed for 100 of the 126 children (79%) with a positive rapid strep test. Of the 126 children with a positive test, 114 (90%) received the correct antibiotic: amoxicillin, penicillin, or an appropriate alternative antibiotic due to b-lactam allergy. Duration of treatment was correct for all 126 children. Using the electronic algorithm, the proportion of inappropriate prescribing was 28 of 450 (6%). The test characteristics of the electronic algorithm (compared to gold standard chart review) for identification of inappropriate antibiotic prescribing were sensitivity (99%, 422 of 427); specificity (100%, 23 of 23); positive predictive value (82%, 23 of 28); and negative predictive value (100%, 422 of 422). **Conclusions:** For children with pharyngitis, an electronic algorithm for identification of inappropriate antibiotic prescribing is highly accurate. Future work should validate this approach in other settings and develop and evaluate the impact of an audit and feedback intervention based on this tool.

Presentation Type:
Poster Presentation

Development of National Infection Control and Prevention Guidelines in Georgia, 2017–2019

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Background: In 2015, the Ministry of Internally Displaced Persons from the Occupied Territories, Labor, Health and Social Affairs (MoLHSA) of Georgia identified infection prevention and control (IPC) as a top priority. Infection control legislation was adopted and compliance was made mandatory for licensure. Participation in the universal healthcare system requires facilities to have an IPC program and infrastructure. To support facilities to improve IPC, MoLHSA and the National Center for Disease Control and Public Health (NCDC) requested assistance from the US CDC to revise the 2009 National IPC guidelines, which were translated versions of international guidelines and not adapted to the Georgian context. **Methods:** An IPC guideline technical working group (TWG), comprising clinical epidemiologists, IPC nurses, head nurses, and infectious diseases doctors from the NCDC, academic and healthcare organizations and the CDC was formed to lead the development of the national IPC guidelines. Additionally, an IPC steering committee was established to review and verify the guidelines' compliance with applicable decrees and regulations. The TWG began work in April 2017 and was divided into 4 subgroups, each responsible for developing specific guideline topics. A general IPC guideline template for low- and middle-income countries was used to develop 7 of the guidelines. Additional reference materials and international guidelines were used to develop all the guidelines. Drafts were shared with the subgroups and the steering committee during 2 workshops to discuss unresolved technical issues and to validate the guidelines. **Results:** The revised guidelines consist of 18 topics. In addition to standard precautions (eg, hand hygiene, personal protective equipment, injection safety, etc) and transmission-based precautions, the guideline topics include laundry, environmental cleaning and disinfection, decontamination and sterilization, occupational health and safety, biosafety in clinical laboratory, blood bank and transfusion services, intensive care unit, emergency room, and mortuary. They do not include healthcare-associated infection surveillance or organism-specific guidance. To supplement the guidelines, a separate implementation manual was developed. The guidelines were approved by MoLHSA in October 2019. The TWG continues to be engaged in IPC activities, assisting with guideline rollout, training, and monitoring, and drafting the National IPC strategy and action plans. **Conclusions:** The Georgian Ministry of Health developed national IPC guidelines using local experts. This model can be replicated in other low- and middle-income countries that lack country-specific IPC guidelines. It can also be adapted to develop facility-level guidelines and standard operating procedures.

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Diagnostic Stewardship Effectively Reduces Healthcare-Onset *Clostridioides difficile* Infections and Concurrent Laxative Use

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Background: *Clostridioides difficile* infection (CDI) accounts for >500,000 community-, nursing-, and hospital-acquired infections (HAIs), as well as 15,000–30,000 deaths, and >$4.8 billion in the United States annually. *C. difficile* toxin B gene nucleic acid amplification testing (NAAT) cannot distinguish between active CDI and colonization, particularly in the setting of laxative use or enteral feeding. Lack of judicious testing can result in the incorrect diagnosis of CDI, unnecessary CDI treatment, increased costs, and falsely augmented HAI rates. Like many healthcare facilities, the VA San Diego Healthcare System (VASDHS) solely utilizes *C. difficile* NAAT for CDI diagnosis. The aim of this study was to implement and evaluate a facility-wide initiative at the VASDHS to reduce healthcare onset, healthcare facility associated CDI (HO-HCFA CDI), including