714. Development of an Evidence-Based Antimicrobial Stewardship Smartphone App in a Tertiary Academic Pediatric and Women’s Health Centre in Canada

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Background. Smart phone use by medical professionals is ubiquitous. In a recent survey, >90% of health care providers were interested in locally developed antimicrobial stewardship (AMS) and infectious diseases applications (“apps”). We describe the process by which our antimicrobial stewardship program (ASP) developed an app to provide guidance regarding empiric antimicrobial choice, and education about antimicrobials and pathogens, integrating local laboratory data. We also describe early app uptake.

Methods. The IWK Health Centre is a 271-bed tertiary care Pediatric and Women’s health centre serving the Maritime Provinces in eastern Canada. Using the Spectrum Mobile Health platform, our ASP developed an app that allows consultation with pediatric and women’s health clinical divisions. Through cooperation with the microbiology laboratory, the app was integrated with our laboratory information system (LIS) allowing real-time access to local antimicrobial results. The iPhone- and Android-compatible app was introduced to health care providers through presentations, conference presentations, email, and word of mouth. Following the official launch, uptake was monitored both in number of app downloads and number of hits. Adherence to treatment guidelines included in the app was assessed utilizing our existing ASP prospective audit and feedback service.

Results. From December 2015 to March 2017, the ASP created content for the IWK AMS App. Three sections were developed: (1) Syndromes: evidence-based empiric treatment guidelines for common syndromes; (2) Antimicrobials—spectrum of activity, dosing regimens, drug monitoring, common usage, adverse effects, drug interactions and pharmacology; (3) Pathogens: information on precautions, local susceptibilities through linkage with our recently developed virtual antibiogram, associated syndromes, and epidemiology. In May 2017, the app was launched. Within the first 24 hours, it was downloaded 157 times and accessed 1,193 times.

Conclusion. We describe the process and early uptake of a locally developed AMS app to complement our ASP, which includes a virtual antibiogram through interfacing with our LIS. This is the first AMS app available in a Pediatric and Women’s Health Care Centre in Canada. Further analysis of the app’s impact on antimicrobial usage is planned.

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715. Implementation of a Vancomycin AUC Monitoring Program: Peaks and Pitfalls

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Background. Accuracy of vancomycin trough monitoring has come into question. We evaluated an area under the curve (AUC) monitoring protocol and 3 different dosing calculators at a single center.

Methods. Adult inpatients with vancomycin AUC monitoring from 5/2016–1/2017 were included. We excluded those with peaks drawn less than 1 hour after infusion. AUC was calculated with Sawchuck-Zaske (SZ) methodology. This was compared with two publicly available online calculators: ClinCalc and UCSF’s infectious disease monitoring program (IDMP). Paired t-tests were used to compare AUCs from ClinCalc and IDMP to SZ. We collected renal function, infection, microbiology, and dosing data. Clinical outcomes included survival to discharge, discharge disposition, rate of acute kidney injury (AKI) per Risk-Injury-Failure-Loss-End Stage Renal Disease criteria, and bacterial clearance.

Results. 29 subjects were included. Median age was 48 years, 59% were male, median weight was 80.4 kg. Median daily dose was 3000 mg (32.4 mg/kg). No patient had renal impairment at baseline. Skin and soft-tissue infections were most common, 11 (38%). Six subjects had bacteremia, 2 had confirmed endocarditis. MRSA was isolated in 14 cases (48%). Median duration of vancomycin was 11 days. Median 24 hour AUC (standard deviation) was 654 (203) mg/L for SZ, 536 (278) mg/L for ClinCalc (P = 0.02) and 556 (187) mg/L (P = 0.004) for IDMP. AUC differences of at least 30% compared with SZ were identified in 14 (48%) and 6 (21%) subjects evaluated with ClinCalc and IDMP, respectively. AKI occurred in three subjects: two risk and one injury. All survived to discharged; 52% discharged home, 41% to a skilled nursing facility, 7% left against medical advice. Twenty (69%) had bacterial clearance, 2 (7%) had persistently positive cultures, 7 (24%) were treated empirically, 1 (3%) had vancomycin AUC values outside of published targets. Vancomycin AUC varies with calculation methodology. The SZ method was impacted by dose and duration of infusion. ClinCalc showed greater variability in higher weight patients. ClinCalc and IDMP calculated lower AUCs than SZ, and recommended higher doses to target an AUC/MIC ratio of at least 400. As institutions adopt vancomycin AUC monitoring, awareness of calculator variation is critical due to impact on dose selection and risk of toxicity to patients.

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716. A Longitudinal Four-year Pre-Post Intervention Study Evaluating the Use of an Antimicrobial Stewardship Application

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Background. Clinical decision support via the electronic health record (EHR) is a vital component of many antimicrobial stewardship initiatives. However, many developed and developing countries lack the necessary infrastructure to perform such tasks. We hypothesized that an antimicrobial stewardship application (app) targeted towards empiric antimicrobial therapy, along with local clinical guidelines/pathways would decrease utilization of our two most commonly over-used antibiotics, piperacillin-tazobactam (PTZ) and vancomycin (VAN).

Methods. A four-year pre-post study was performed following the implementation of our antimicrobial stewardship web-based app. The app was introduced to those on medical services/wards and not to users on surgical services/wards. Comparative utilization of PTZ and VAN were subsequently measured among medical and surgical wards in the form of days of therapy (DOT) per 1,000 patient-days.

Results. Following the intervention period, annual VAN utilization among medical wards decreased from 171 DOT per 1,000 patient-days to 139 DOT per 1,000 patient-days, while increasing from 106 DOT per 1,000 patient-days to 126 DOT per 1,000 patient-days among surgical wards (Figure 1). Similarly, PTZ utilization declined from 141 DOT per 1,000 patient-days to 80 DOT per 1,000 patient-days among medical wards, while increasing from 128 DOT per 1,000 patient-days to 132 DOT per 1,000 patient-days among surgical wards (Figure 2). App analytics demonstrated an average user time of 2.68 minutes per session with the respiratory and urinary tract sections being the most commonly visited.

Conclusion. In settings where EHR clinical decision support is not available, an antimicrobial stewardship app targeting empiric therapy can be used successfully to decrease utilization of inappropriate antibiotics. Future work will look at incorporating more comprehensive guidelines to help with clinical decision-making.

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